

DESIGN DATA			
Traffic	Average Daily		
Current 2025	Pass: 78	Trucks: 22	Total: 100
Forecast 2045	Pass: 116	Trucks: 33	Total: 149
Clear Zone Distance: 18'		Design Speed: 55 MPH	
Minimum Sight Dist. for Stopping: 495'		Bridges: Sta. 23+04	
Sight Dist. for No Passing Zone: N/A		Design Load: HL-93	
Pavement Design Life: N/A			

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	23735	1	1

MORTON COUNTY, NORTH DAKOTA

PLANS FOR STRUCTURE REPLACEMENT BRIDGE NO. 30-128-19.0 (30-128-19.1) FEDERAL AID PROJECT NO. BRC-3027(056);PCN 23735

PROJECT IS LOCATED 0.6 MILES SOUTH OF ALMONT, NORTH DAKOTA
PROJECT CONSISTS OF REPLACING THE EXISTING BRIDGE WITH A NEW
STRUCTURE, MINOR GRADING, AND INCIDENTALS

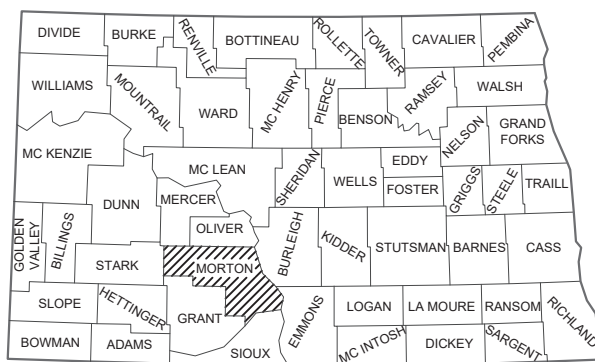
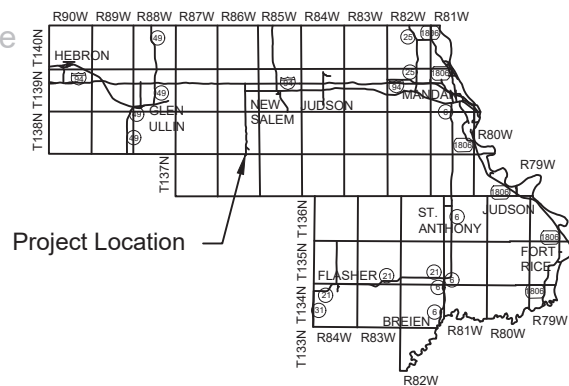
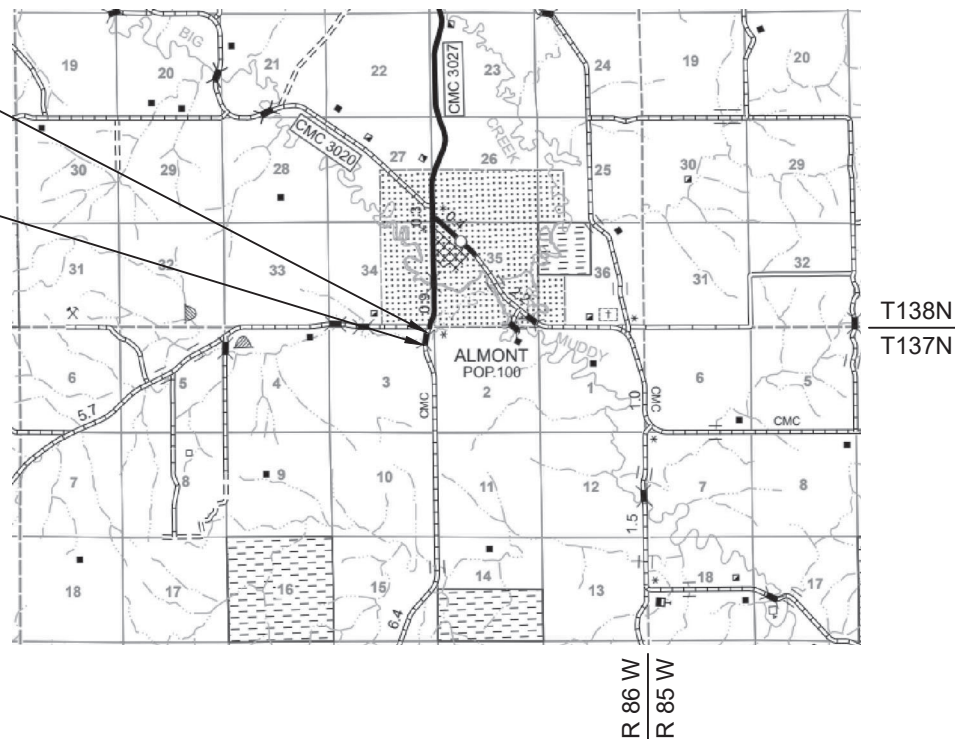
GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	7/1/2025
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
BRC-3027(056)	0.148	0.148



End Project - Sta. 26+30
A point 341.59' west and 270.65' south of the NE 1/4 corner of Section 3, T137N, R86W Morton County

Begin Project - Sta. 18+50
A point 451.65' west and 1,037.32' south of the NE 1/4 corner of Section 3, T137N, R86W Morton County



Morton County Commissioners
Nathan Boehm
Jackie Buckley
Andy Zachmeier
Raymond Morrell
Paul Tokoch

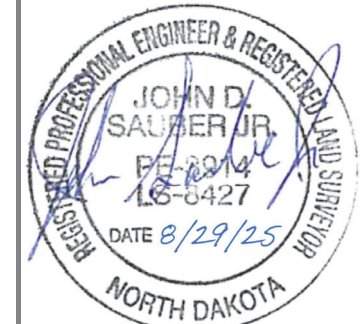


I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 8/29/25

John Sauber Jr. Digitally signed by John Sauber Jr. Date: 2025.08.29 12:54:01 -05'00'

Sauber Engineering, Inc



DESIGNER John Sauber, Jr., PE/PLS
DESIGNER Joe Baneck, PE
DESIGNER Payton Schafer

STATE COUNTY MAP

Project Location

SKETCH MAP OF MORTON COUNTY

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TABLE OF CONTENTS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	2	1

PLAN SECTIONS

Section	Page(s)	Description
1	1	Title Sheet
2	1	Table of Contents
4	1	Scope of Work
6	1 - 2	Notes
8	1	Quantities
10	1	Basis of Estimate
20	1 - 3	General Details
30	1 - 3	Typical Sections
51	1	Allowable Pipe List
60	1 - 2	Plan & Profile
75	1	Wetland Impacts
76	1	Temporary Erosion Control
77	1	Permanent Erosion Control
81	1	Survey Coordinate and Curve Data
100	1 - 2	Work Zone Traffic Control
170	1 - 3	Bridges and Box Culverts
200	1 - 6	Cross Sections

LIST OF STANDARD DRAWINGS

Number	Description
D-101-1, 2, 3, 4	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20, 21	Line Styles
D-101-30, 31, 32, 33	Symbols
D-260-1	Erosion And Siltation Controls - Silt Fence
D-261-1	Erosion Control - Fiber Roll Placement Details
D-704-7	Breakaway Systems For Construction Zone Signs - Perforated Tube
D-704-8	Breakaway Systems For Construction Zone Signs - U-Channel Post
D-704-9	Construction Sign Details - Terminal And Guide Signs
D-704-10	Construction Sign Details - Regulatory Signs
D-704-11	Construction Sign Details - Warning Signs
D-704-13	Barricade And Channelizing Device Details
D-704-14	Construction Sign Punching And Mounting Details
D-704-15	Road Closure Layouts
D-704-20	Terminal And Seal Coat Sign Layouts
D-704-22	Construction Truck And Temporary Detour Layouts
D-704-50	Portable Sign Support Assembly
D-714-22	Concrete Pipe, Cattle Pass, or Precast Concrete Box Culvert Ties
D-752-1	Standard Barbed Wire Fence
D-754-82	Object Markers

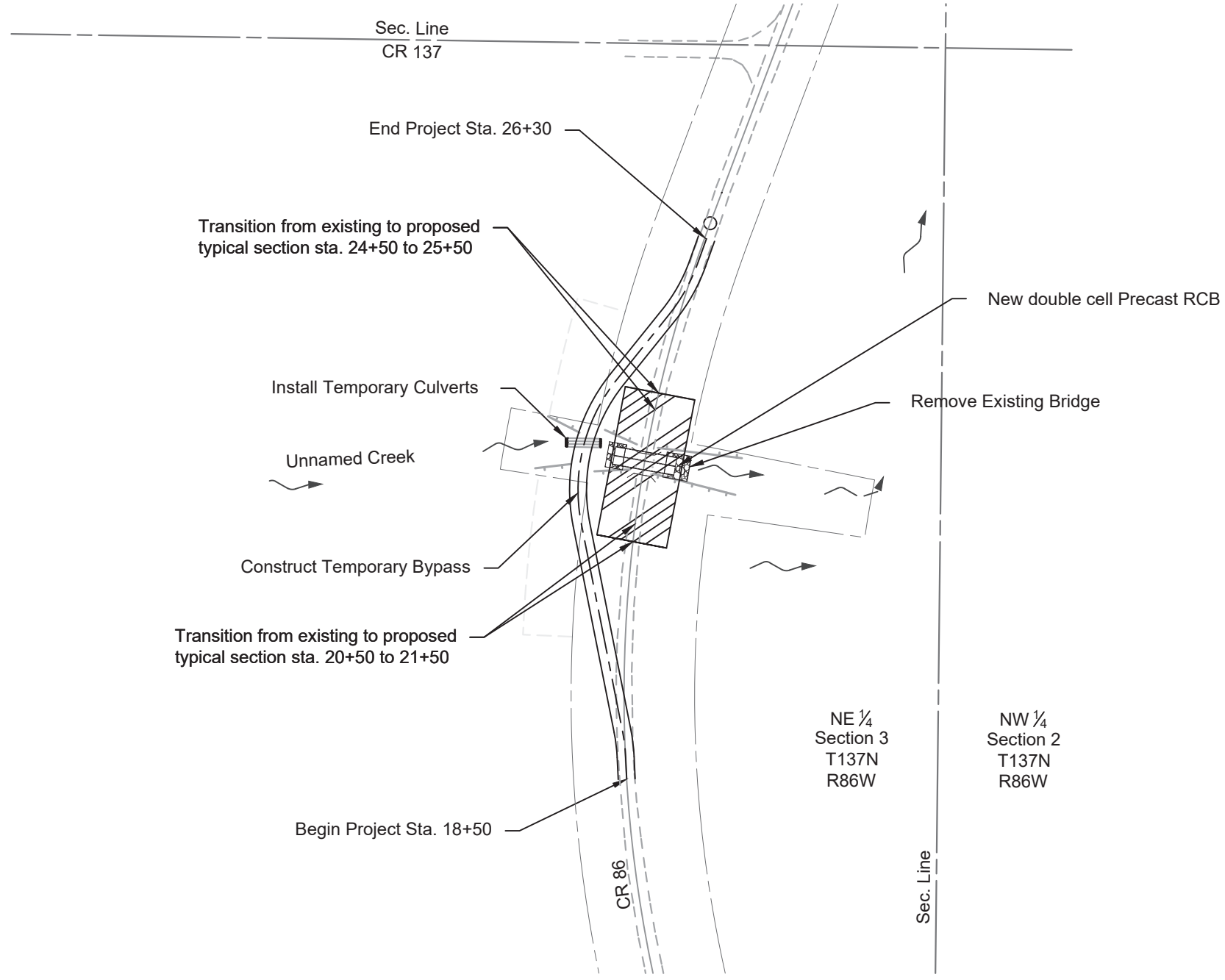
SPECIAL PROVISIONS

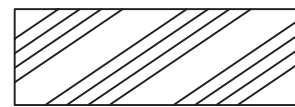
Number	Description
PSP 5(25)	Permits and Environmental Consideration
SP 20(25)	Temporary Water Diversion
SSP 1	Temporary Erosion and Sediment Best Management Practices
SSP 2	Federal Migratory Bird Treaty Act

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	4	1



SE 1/4
Section 34
T138N
R86W



 - Roadway Reconstruction



Structure Replacement
Scope of Work
Bridge No. 30-128-19.1
Morton County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	6	1

NOTES

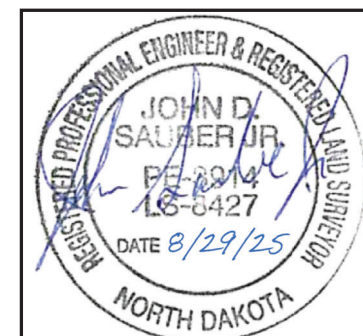
- 105-P01 UTILITIES: The horizontal utility locations shown in the plans are approximate. Plan locations should not be interpreted as exact for bidding purposes.
- 202-P01 REMOVAL OF TEMPORARY BYPASS: Restore the area impacted by the construction of the temporary bypass to the original contours. Include the costs to restore the impacted area in the bid item, "Removal of temporary Bypass."

Include all costs to remove the temporary bypass including embankment, culverts, class 13, and riprap in the bid item, "Removal of Temporary Bypass."
- 203-010 SHRINKAGE: 25 Percent additional volume is included for shrinkage in earth embankment.
- 203-P01 TOPSOIL: The existing topsoil shall be removed and salvaged. Removal is based upon a 6" depth. Upon completion of the grading operation, the topsoil shall be spread evenly over disturbed areas and seeded. Measurements for all topsoil shall be Plan Quantity.
- 203-P02 WETLAND TOPSOIL: The existing wetland topsoil shall be removed and salvaged. Removal is based upon a 6" depth. Upon completion of the grading operation, the topsoil shall be spread evenly over disturbed areas and seeded. Measurements for all Wetland Topsoil shall be Plan Quantity.
- 203-P02 EMBANKMENT: Placement of embankment material shall be in accordance with section 203.04 G.3 of the Standard Specification. After the topsoil has been removed all embankment areas shall be scarified to a depth of 6" and re-compacted. Benching of the existing embankment shall be required. The cost for scarifying, recompacting and benching shall be included in the bid item "Common Excavation – Type B". Measurement of "Common Excavation – Type B" will be plan quantity.
- 203-P03 BORROW-EXCAVATION: All borrow needed for the project shall be furnished by the contractor.
- 203-P04 CHANNEL EXCAVATION: Excavation required to shape the channel, including the reestablishment and rehabilitation mitigation, shall be included in the Lump Sum Bid item "Channel Excavation." There is an estimated quantity of 700 CY of Channel Excavation.
- 251-P01 SEEDING & COVER CROP: Measurements for seeding and cover crop shall be plan quantity.
- 253-P01 MULCH: Measurements for mulch shall be plan quantity.
- 261-P01 TEMPORARY EROSION CONTROL: Use the existing topsoil to create an earthen berm at the limits of construction. The topsoil berm in conjunction with the existing vegetation and the devices shown in the plans will serve as the temporary erosion control.

Build the berm to a 1.0 foot minimum height. Allow stormwater to drain through the berm as needed by placing intermittent weirs along the length of the berm. Construct the weirs no more than 5.0 feet wide and place fiber rolls across the weir on the downstream side of the berm. If stormwater is present at the time of the weir construction, place fiber rolls prior to construction of the weir. 100 LF has been added to the quantity of Fiber Rolls 12IN for the weirs and other areas where runoff leaves the site as directed by the engineer. All costs associated with construction, maintaining, and removing the berm shall be included in the bid item "Topsoil".

704-P01 TRAFFIC CONTROL: The traffic control devices list has been developed using the following layouts on the Standard Drawing for traffic Control:

1. Standards D-704-7, 8, 9, 10, 11, 13, 14, are applicable.
2. Standard D-704-15, Type B for Temporary Bypass
3. Standard D-704-20, Type G for Terminal Sign Layout
4. Standard D-704-22, Type K for trucks entering and Type L for trucks crossing.



ENVIRONMENTAL NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	6	2

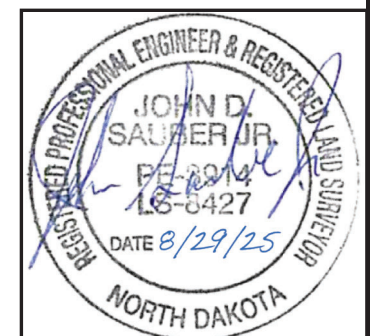
ENVIRONMENTAL NOTES (EN): The North Dakota Department of Transportation, Morton County and the Federal Highway Administration have made environmental commitments to secure approval of this project. The following environmental notes are requirements to comply with these commitments:

EN-1 AQUATIC NUISANCE SPECIES (ANS): Equipment that was last used outside of North Dakota or within a Class I infested waterbody (identified on the North Dakota Game and Fish Department (NDGFD) website) requires an inspection by NDGFD. Notify the NDGFD at least 10 business days prior to pumps, watercraft, or any equipment entering a public water to allow the NDGFD sufficient time to inspect any and all such equipment for ANS. Contact the NDGFD ANS Coordinator, Ben Holen by e-mail - bholen@nd.gov for equipment inspections. Supply one of the following to the engineer as proof of compliance prior to work taking place in the water: (1) the NDGFD inspection report, (2) documented NDGFD correspondence (email or signed letter).

EN-2 TEMPORARY WETLAND IMPACT: Temporary impact areas within wetlands and or other waters are incorporated into the plans for this project. Remove temporary fill placed and sedimentation in wetlands or other waters. Restore these wetlands to preconstruction contours.

NOTIFICATIONS TO BE FILED BY CONTRACTOR:

- North Dakota Department of Environmental Quality – NDPDES Permits Obtained by contractor, owner is Morton County.



Estimated Quantities

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
103	0100	CONTRACT BOND	L SUM	1
201	0330	CLEARING & GRUBBING	L SUM	1
202	0105	REMOVAL OF STRUCTURE	L SUM	1
202	0312	REMOVE EXISTING FENCE	LF	470
202	0350	REMOVAL OF TEMPORARY BYPASS	EA	1
203	0102	COMMON EXCAVATION-TYPE B	CY	293
203	0109	TOPSOIL	CY	1017
203	0121	TOPSOIL-WETLAND	CY	137
203	0140	BORROW-EXCAVATION	CY	2875
210	0109	CLASS 2 EXCAVATION-BOX CULVERT	EA	1
210	0127	CHANNEL EXCAVATION	L SUM	1
210	0210	FOUNDATION FILL	CY	539
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
216	0100	WATER	M GAL	59
251	0200	SEEDING CLASS II	ACRE	1.2
251	1000	WETLAND SEED	ACRE	0.4
251	2000	TEMPORARY COVER CROP	ACRE	1.2
253	0101	STRAW MULCH	ACRE	3.2
256	0200	RIPRAP GRADE II	CY	120
260	0200	SILT FENCE SUPPORTED	LF	90
260	0201	REMOVE SILT FENCE SUPPORTED	LF	90
261	0112	FIBER ROLLS 12IN	LF	980
261	0113	REMOVE FIBER ROLLS 12IN	LF	540
302	0356	AGGREGATE SURFACE COURSE CL 13	TON	1195
606	3208	DBL 12FT X 8FT PRECAST RCB CULVERT	LF	60
606	7208	DBL 12FT X 8FT PRECAST RCB END SECTION	EA	2
702	0100	MOBILIZATION	L SUM	1
704	1000	TRAFFIC CONTROL SIGNS	UNIT	963
704	1052	TYPE III BARRICADE	EA	6
704	1060	DELINEATOR DRUMS	EA	8
704	1081	VERTICAL PANELS-BACK TO BACK	EA	44
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	303
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	180
709	0161	GEOSYNTHETIC MATERIAL TYPE S1	SY	303
714	4128	PIPE CONDUIT 48IN-APPROACH	LF	88
752	0320	FENCE BARBED WIRE 4 STRAND-STEEL POST	LF	470
752	0905	TEMPORARY FENCE	LF	470
752	4140	DOUBLE BRACE ASSEMBLY BARBED WIRE-WOOD POST	EA	2
754	0803	OBJECT MARKERS - TYPE III	EA	4
900	1000	TEMPORARY STREAM DIVERSION	EA	1

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRC-3027(056)	10	1

Basis of Estimate

Materials

Aggregate Surface Course Class 13 - 1.875 Tons/CY

Topsoil

6" Depth - Construction limits minus existing road surface

Water

Dust Palliative Material - 25 Mgal/mile
 Aggregate Surface Course Class 13 - 20 Gal/Ton
 Embankment - 10 Gal/CY

Seeding, Mulching, Temporary Cover Crop

Based on a width 10' outside the construction limits

Fiber Rolls

12IN Slope Protection - 880 LF
 12IN Weirs/As directed by Engineer - 100 LF

Earthwork Summary

Mainline Common Excavation - 245 CY
 Mainline Borrow Excavation - 645 CY
 Bypass Common Excavation - 48 CY
 Bypass Borrow Excavation - 2230 CY

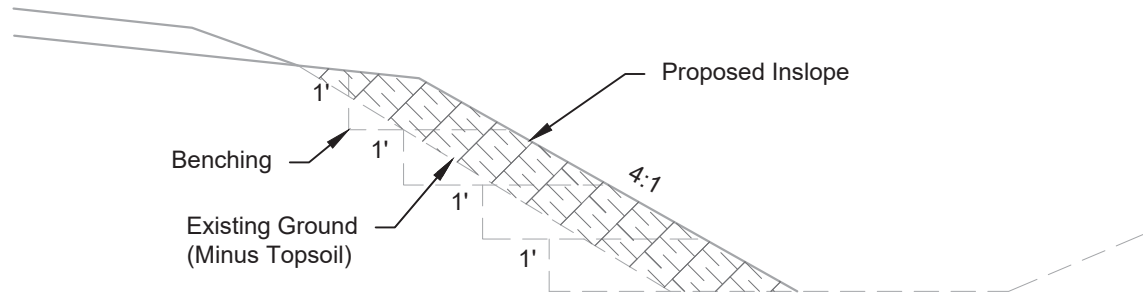
Aggregate Surface Course Class 13

90 Tons for transition from Sta. 20+50 to Sta. 21+50
 90 Tons for transition from Sta. 24+50 to Sta. 25+50

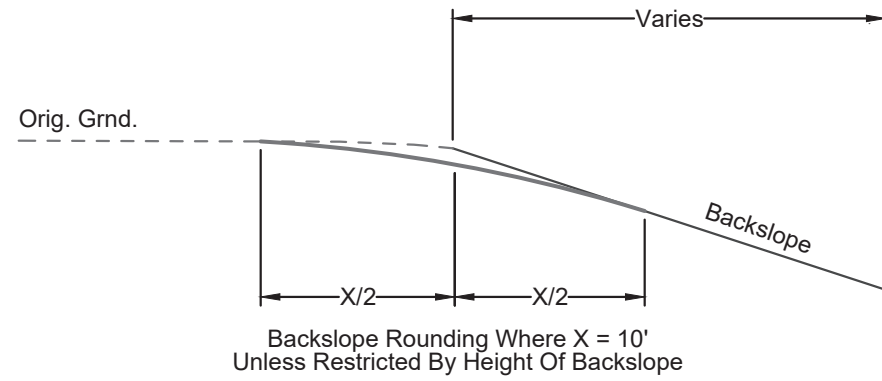


Structure Replacement
 Basis of Estimate
 Bridge No. 30-128-19.1
 Morton County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	20	1



BENCHING TYPICAL SECTION



Backslope Rounding Where X = 10'
Unless Restricted By Height Of Backslope

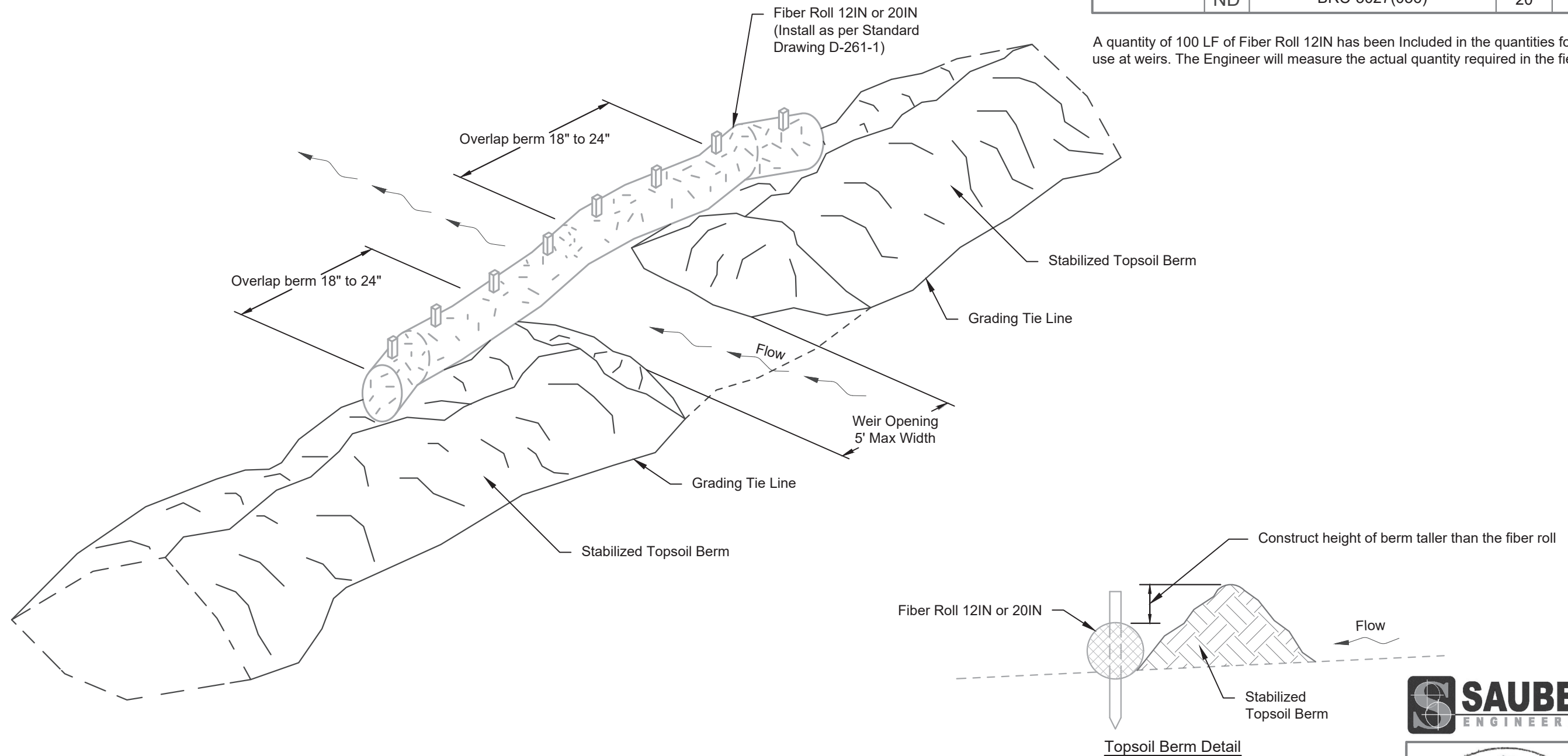
BACKSLOPE ROUNDING



Structure Replacement
 Benching and Backslope Detail
 Bridge No. 30-128-19.1
 Morton County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	20	2

A quantity of 100 LF of Fiber Roll 12IN has been Included in the quantities for use at weirs. The Engineer will measure the actual quantity required in the field.



Notes:

1. Windrow the existing topsoil from the foreslope to create a berm at the grading tie line.
2. Stabilize berms in accordance with the Construction General Permit.
3. Place weirs intermittently throughout the length of the berm to allow stormwater to drain through the berm.
4. Avoid placing weirs adjacent to waterbodies.
5. Install fiber rolls as the weirs are created in the topsoil berm.
6. Include costs to create, stabilize, maintain, and dismantle the berm in the unit price bid for "Topsoil".
7. Include costs for fiber rolls in the unit price bid for "Fiber Rolls 12IN" or "Fiber Rolls 20IN".



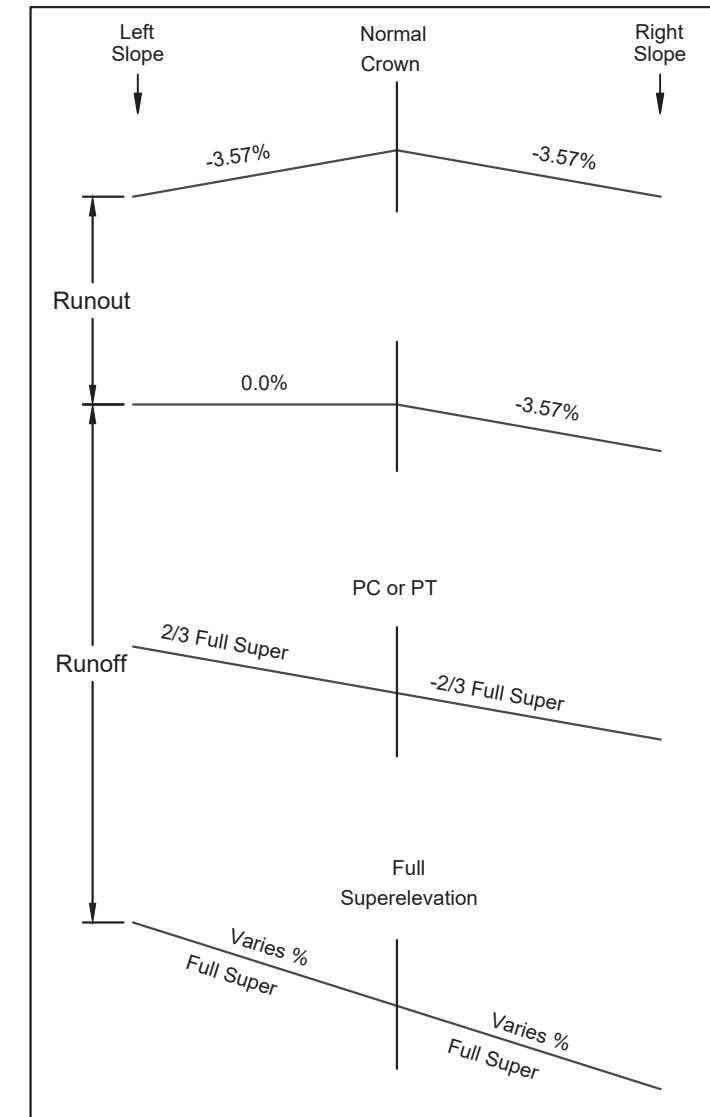
Structure Replacement
 Temporary Topsoil Berm & Weir Detail
 Bridge No. 30-128-19.1
 Morton County, ND

Curve PCL-86-1

P.C. Station 12+90.65
 P.I. Station 20+02.99
 Delta = 41°06'14" (RT)
 Degree = 3°0'56"
 Tangent = 712.34'
 Length = 1,363.05'
 Radius = 1,900.00'
 P.T. Station 26+53.71

Station	Left Slope	Right Slope
20+50	existing	existing
21+50	5.0	-5.0
24+50	5.0	-5.0
25+50	existing	existing

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	20	3

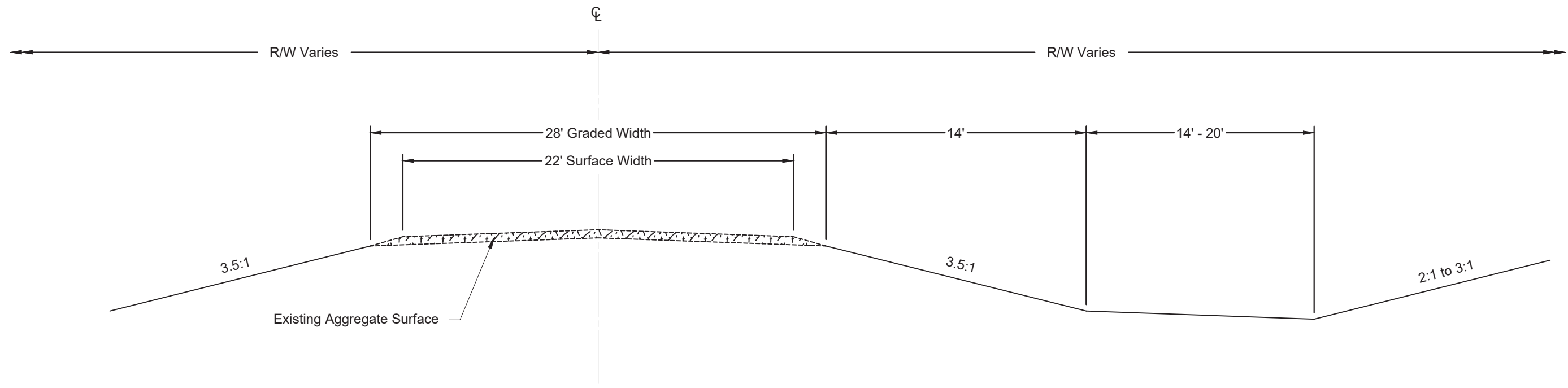


Structure Replacement
 Superelevation Table
 Bridge No. 30-128-19.1
 Morton County, ND

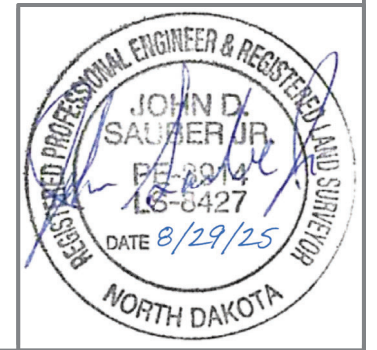
Note: Calculations based on AASHTO method five. A design speed of 55 mph and maximum superelevation of 6% were used.



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	30	1

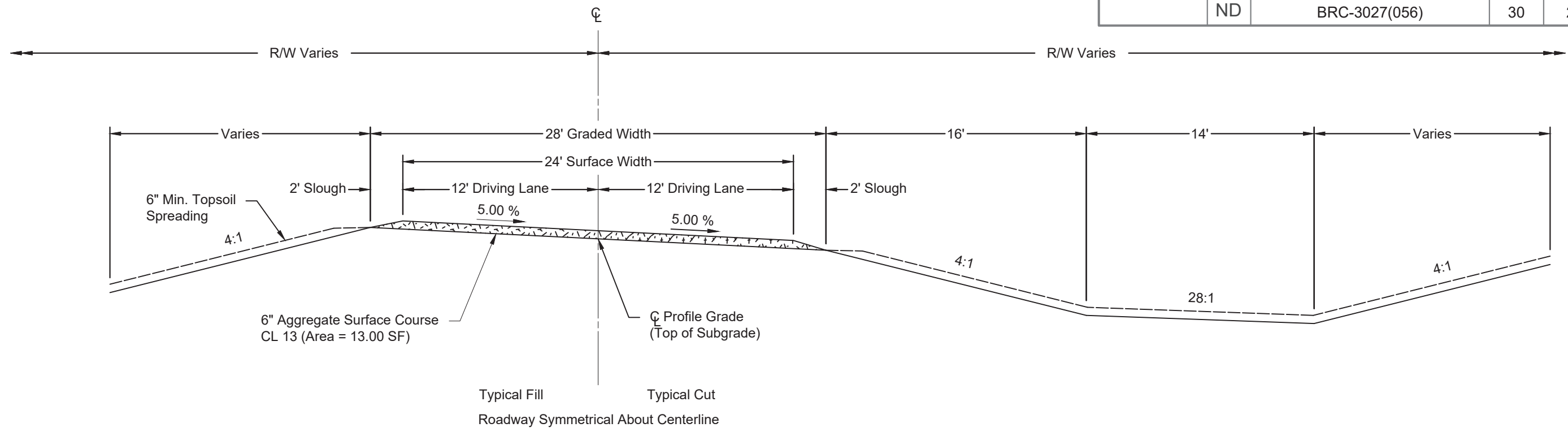


Existing Typical Section
 County Road 86
 Sta. 20+50 to Sta. 25+50

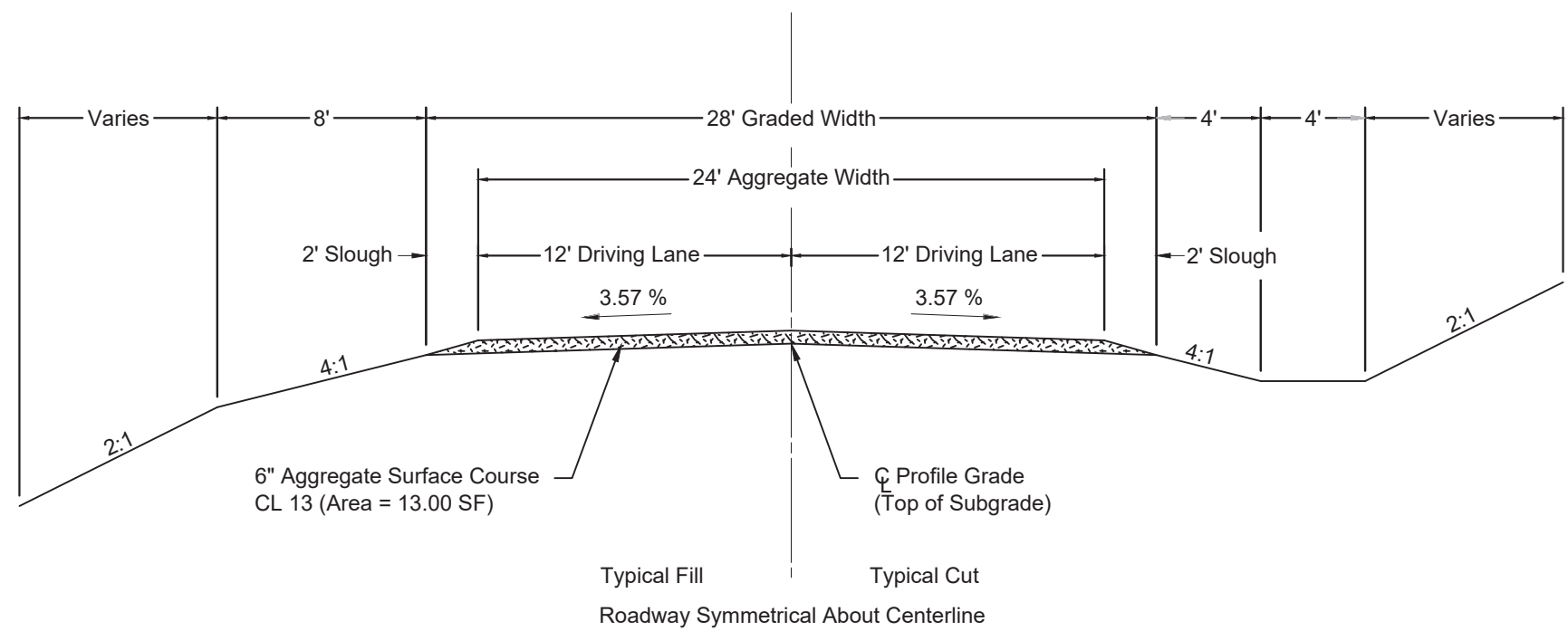


Structural Replacement
 Existing Typical Section
 Bridge No. 30-128-19.1
 Morton County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	30	2



Proposed Typical Section
 Bridge No. 30-128-19.1
 Sta. 21+50 to Sta. 24+50

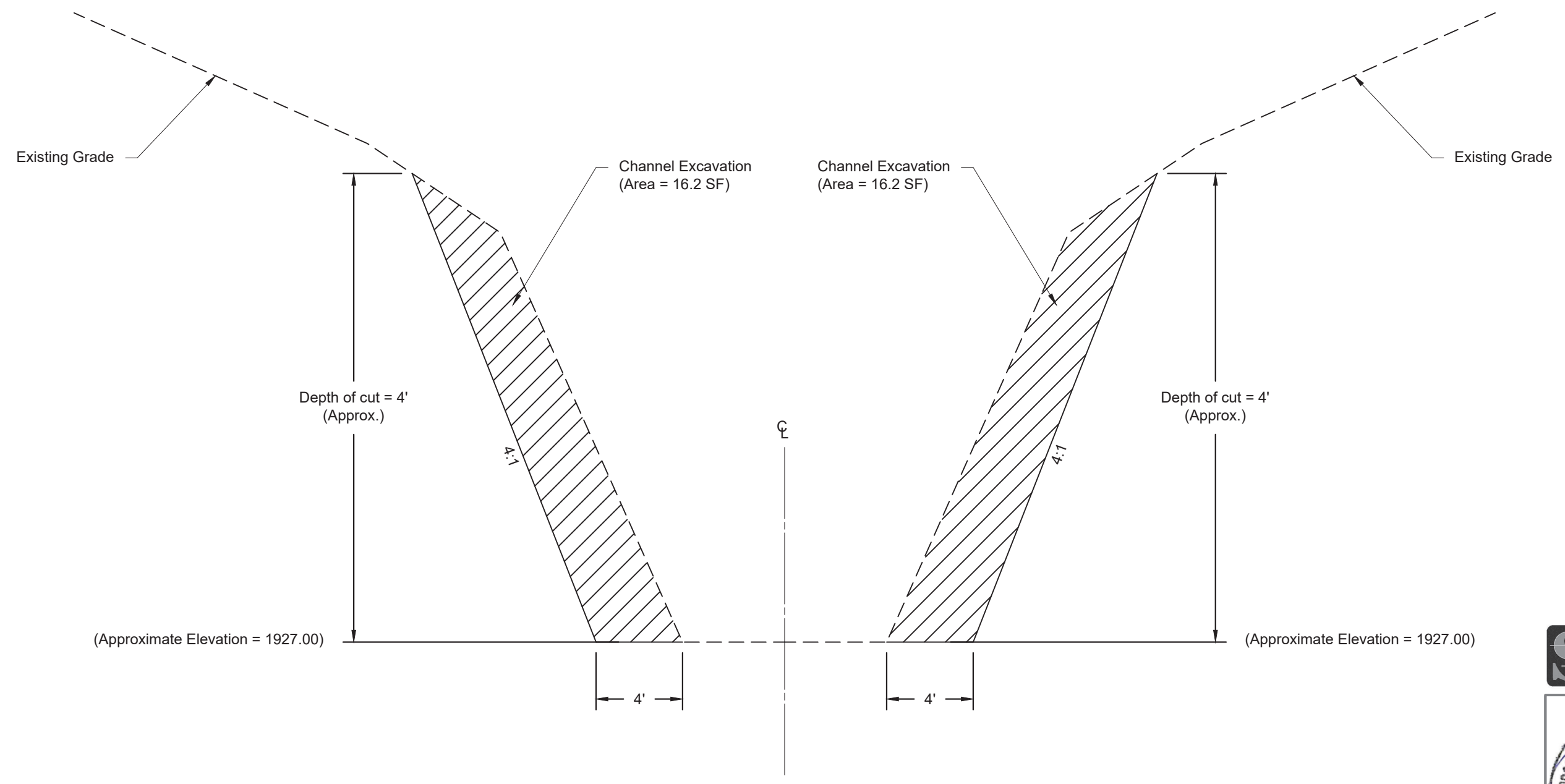


Bypass Typical Section
 Bridge No. 30-128-19.1
 Sta. 0+00 to 8+24



Structure Replacement
 Proposed Typical Section
 Bridge No. 30-128-19.1
 Morton County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	30	3



Channel Excavation Typical Section
75' Rt to 325' Rt



Structure Replacement
 Channel Excavation Typical Section
 Bridge No. 30-128-19.1
 Morton County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)		Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	Geosynthetic Material - Type G (Pay Item)	(*) End Sections		Applicable Backfill	
				In	LF							Begin	End		
				In	Bid Item	LF	In	Type		In	SY	EA	EA		
4+78 / Bypass	22' Lt	4+78 / Bypass	22' Rt	48	Pipe Conduit - Approach	44	Reinforced Concrete Pipe - Class III (barrel length = 44 LF)								Specification 714.04 A
							Corrugated Steel Pipe	48	Z, A, P	2, 3, 5	0.064				
							Spiral Rib Steel Pipe	48	Z, A, P	3/4, 1	0.064				
4+84 / Bypass	22' Lt	4+84 / Bypass	22' Rt	48	Pipe Conduit - Approach	44	Reinforced Concrete Pipe - Class III (barrel length = 44 LF)							Specification 714.04 A	
							Corrugated Steel Pipe	48	Z, A, P	2, 3, 5	0.064				
							Spiral Rib Steel Pipe	48	Z, A, P	3/4, 1	0.064				

Corrugations: 2 = 2-2/3"x1/2"
3 = 3"x1"
5 = 5"x1"

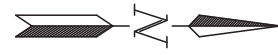
Coatings: Z = Zinc
A = Aluminum
P = Polymeric (over Zinc or Aluminum)

Spiral Ribs: 3/4 = 3/4"x3/4"@7-1/2"
1 = 3/4"x1"@11-1/2"

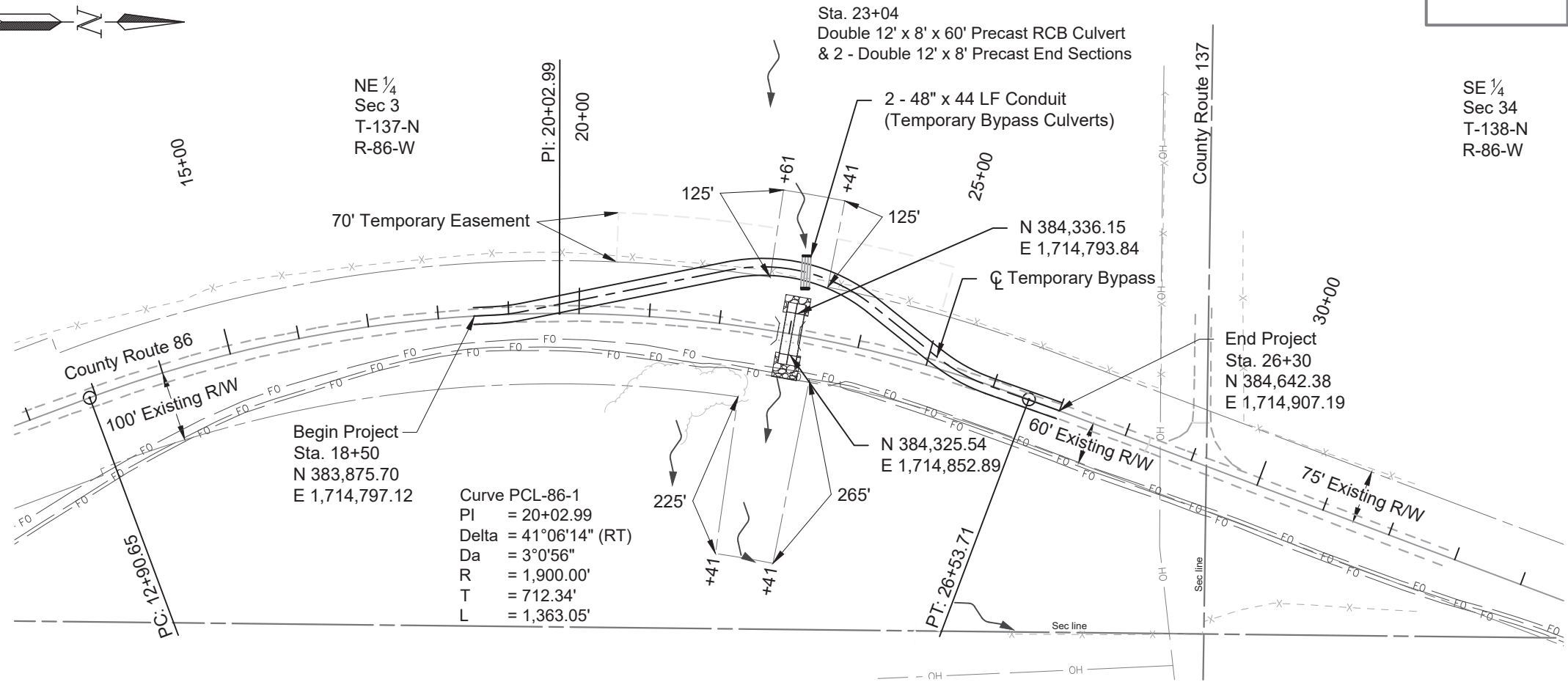
(*) End sections are measured and paid for separately for pipe extensions.
FES = Flared End Section
TES = Traversable End Section



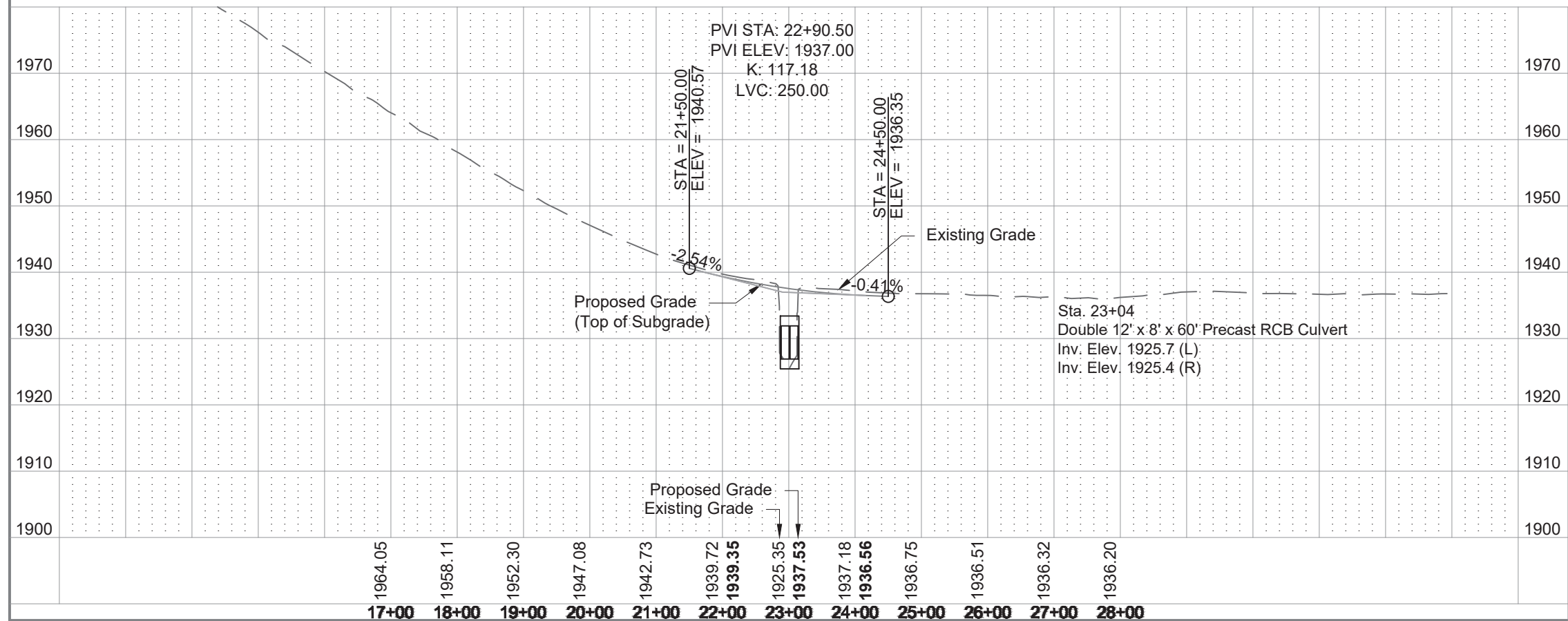
Structure Replacement
Allowable Pipe List
Bridge No. 30-128-19.1
Morton County, ND



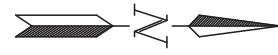
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	60	1



<u>202 0312 REMOVE EXISTING FENCE</u>	Sta. 20+50 Lt to Sta. 25+00 Lt	470 LF
<u>752 0320 FENCE BARBED WIRE 4 STRAND-STEEL POST</u>	Sta. 20+50 Lt to Sta. 25+00 Lt	470 LF
<u>752 0905 TEMPORARY FENCE</u>	Sta. 20+50 Lt to Sta. 25+00 Lt	470 LF
<u>752 4140 DOUBLE BRACE ASSEMBLY BARBED WIRE-WOOD POST</u>	Sta. 20+50 Lt	1 EA
	Sta. 25+00 Lt	1 EA
<u>754 0803 OBJECT MARKERS - TYPE III</u>	Sta. 22+91	2 EA
	Sta. 23+17	2 EA



Structure Replacement
 Sta. 18+50 to Sta. 26+30
 Plan & Profile
 Bridge No. 30-128-19.1
 Morton County, ND

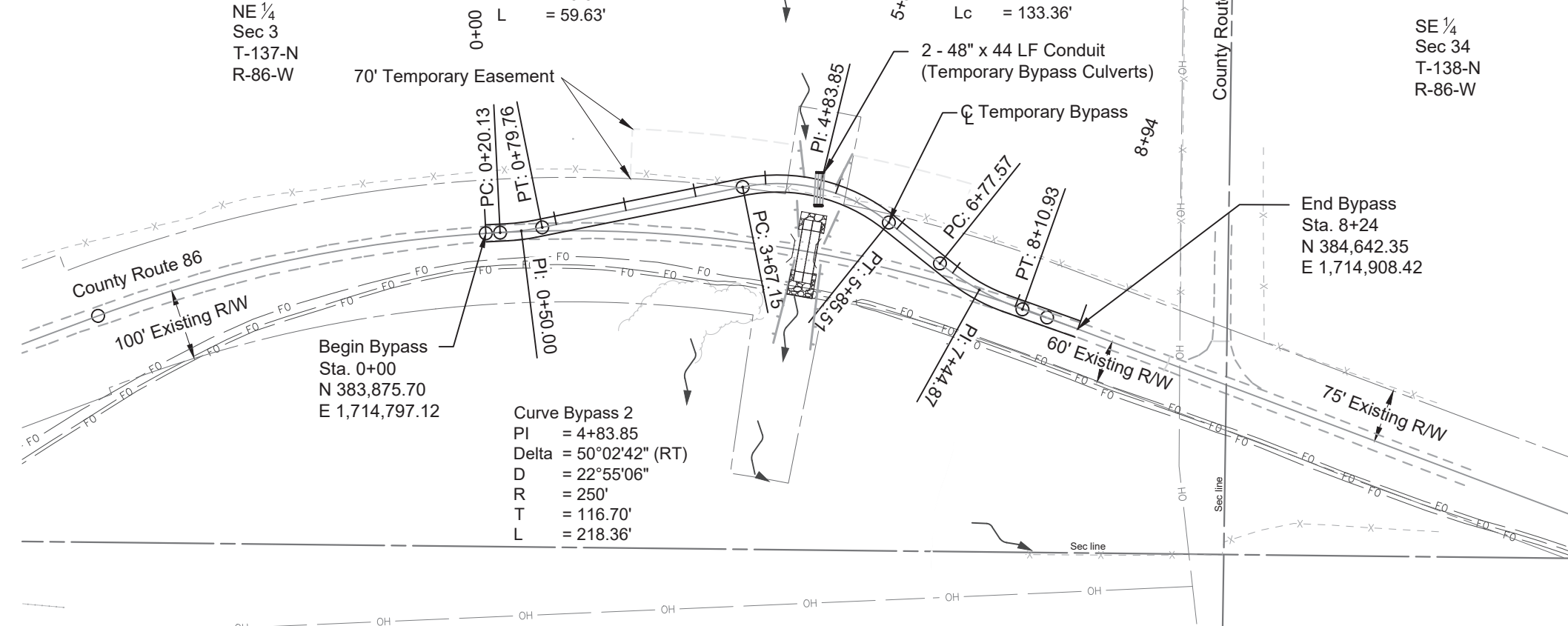


NE 1/4
Sec 3
T-137-N
R-86-W

Curve Bypass 1
PI = 0+50.00
Delta = 8°32'29" (LT)
D = 14°19'26"
R = 400'
T = 29.87'
L = 59.63'

Curve Bypass 3
PI = 7+44.87
Delta = 19°06'06" (LT)
D = 14°19'26"
R = 400'
T = 67.30'
Lc = 133.36'

Curve Bypass 2
PI = 4+83.85
Delta = 50°02'42" (RT)
D = 22°55'06"
R = 250'
T = 116.70'
L = 218.36'

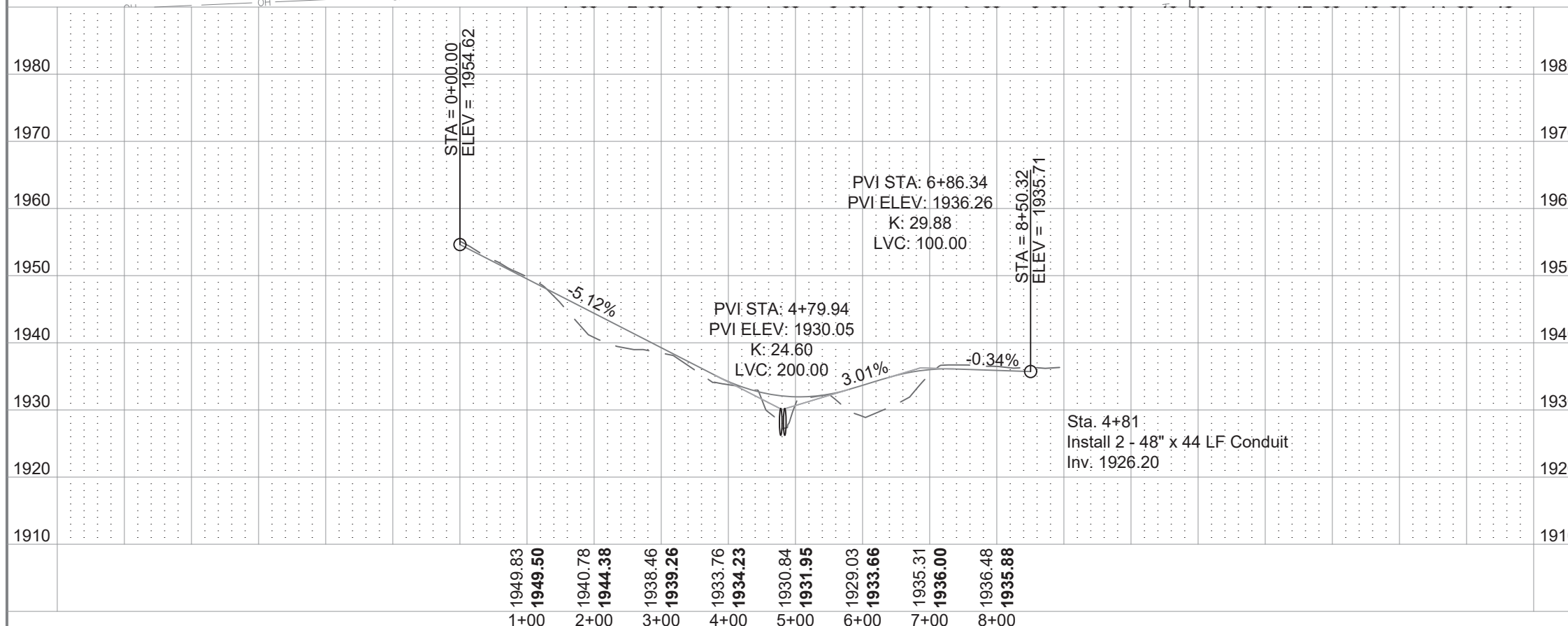


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	60	2
714 4128 PIPE CONDUIT 48IN-APPROACH Sta. 4+81		88 LF	

SE 1/4
Sec 34
T-138-N
R-86-W

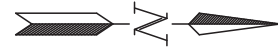
Begin Bypass
Sta. 0+00
N 383,875.70
E 1,714,797.12

End Bypass
Sta. 8+24
N 384,642.35
E 1,714,908.42

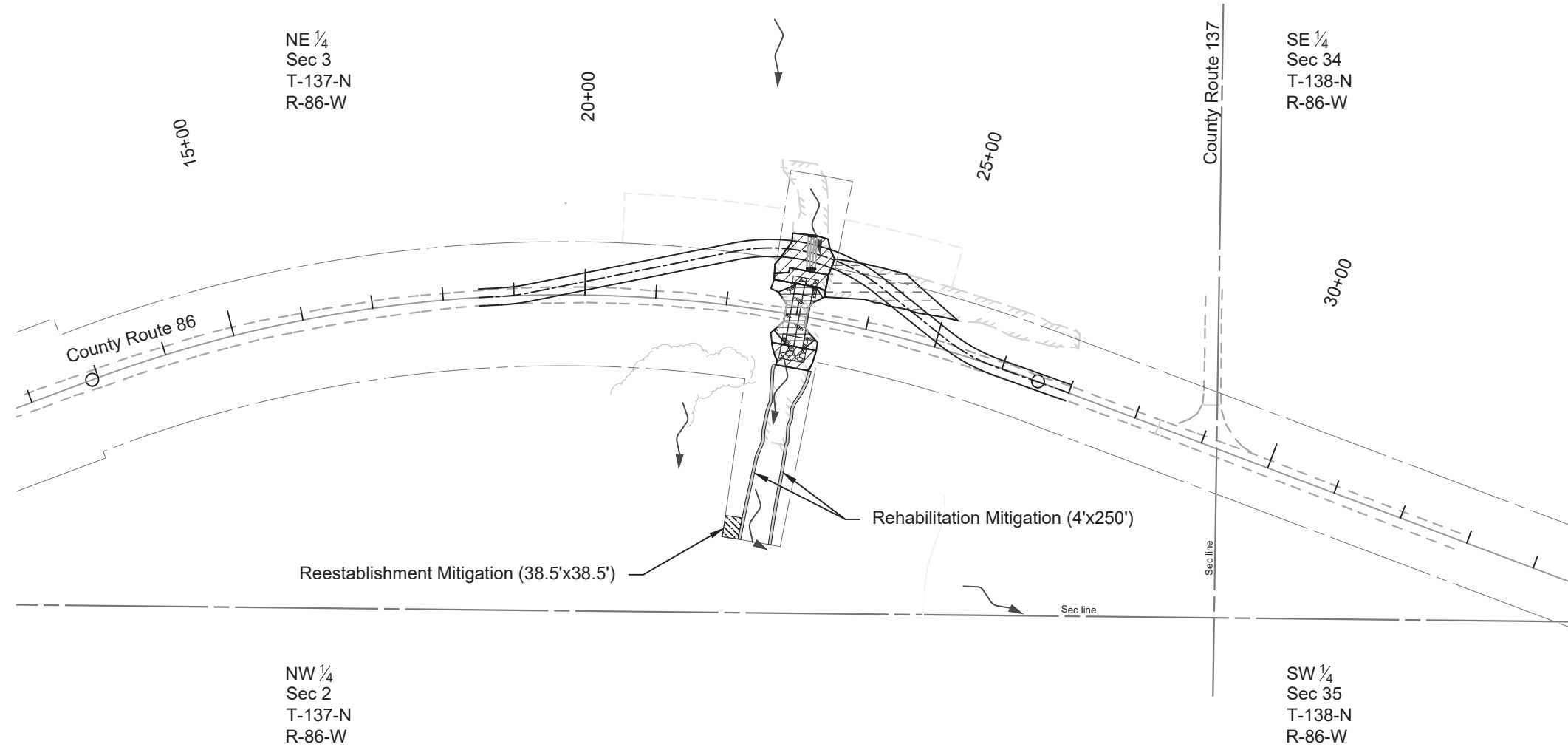


Structure Replacement
Sta. 0+00 to Sta. 8+24
Temporary Bypass Plan & Profile
Bridge No. 30-128-19.1

Morton County, ND



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	75	1



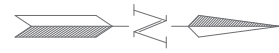
- Other Waters Impact Temporary (0.192 Acres)
- Wetlands Impact Temporary (0.170 Acres)
- Reestablishment Mitigation (0.034 Acres)
- Other Waters Impact Permanent (0.076 Acres)
- Rehabilitation Mitigation (0.046 Acres)

Wetland Impact Table																							
Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands ¹	Wetland Impact					Wetland Mitigation													
					Wetland Impacts			USFWS Easement Impacts		Mitigation Proposed			USACE 11990 Bank		11990 Bank		USFWS Bank		Onsite Mitigation Method			Onsite Constructed Location	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Location	Acres(s)	Location	Acres(s)	Location	Acres(s)	Mitigation Location; Ratio	Ditch Shift	Onsite	Onsite Constructed Site #	Onsite Constructed Size
1	Sec 3, T-137-N R-86-W	Ditch	Created	Y	0.170	0.000	0.000	52.000	0.000	N	N	N	-	-	-	-	-	-	-	-	-	-	-
Totals					0.170	0.000	0.000	52.000	0.000					0		0		0		0.000	0.000		0.000

Other Waters and Streams Impact Table																			
Number	Location	Type	Feature	USACE Jurisdictional ¹	Impacts to Other Waters					Other Water Mitigation									
					Acres			Linear Feet		Mitigation Proposed			USACE Mitigation Bank		Onsite Mitigation Method		Onsite Constructed Location		
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm. (Fill/Drain)	Perm. (Cut)	EO 11990	USACE	USFWS	Location	Acres(s)	Mitigation Location; ratio	Acres(s)	Onsite Constructed Site #	Onsite Constructed Size
OW-2	Sec 3, T-137-N R-86-W	Perennial Stream	Natural	Y	0.192	0.076	0.000	71.000	88.000	0.000	Y	Y	N	-	-	1:1	0.08	1	0.080
Totals					0.192	0.076	0.000	71.000	88.000	0.000					0.000		0.080		0.080

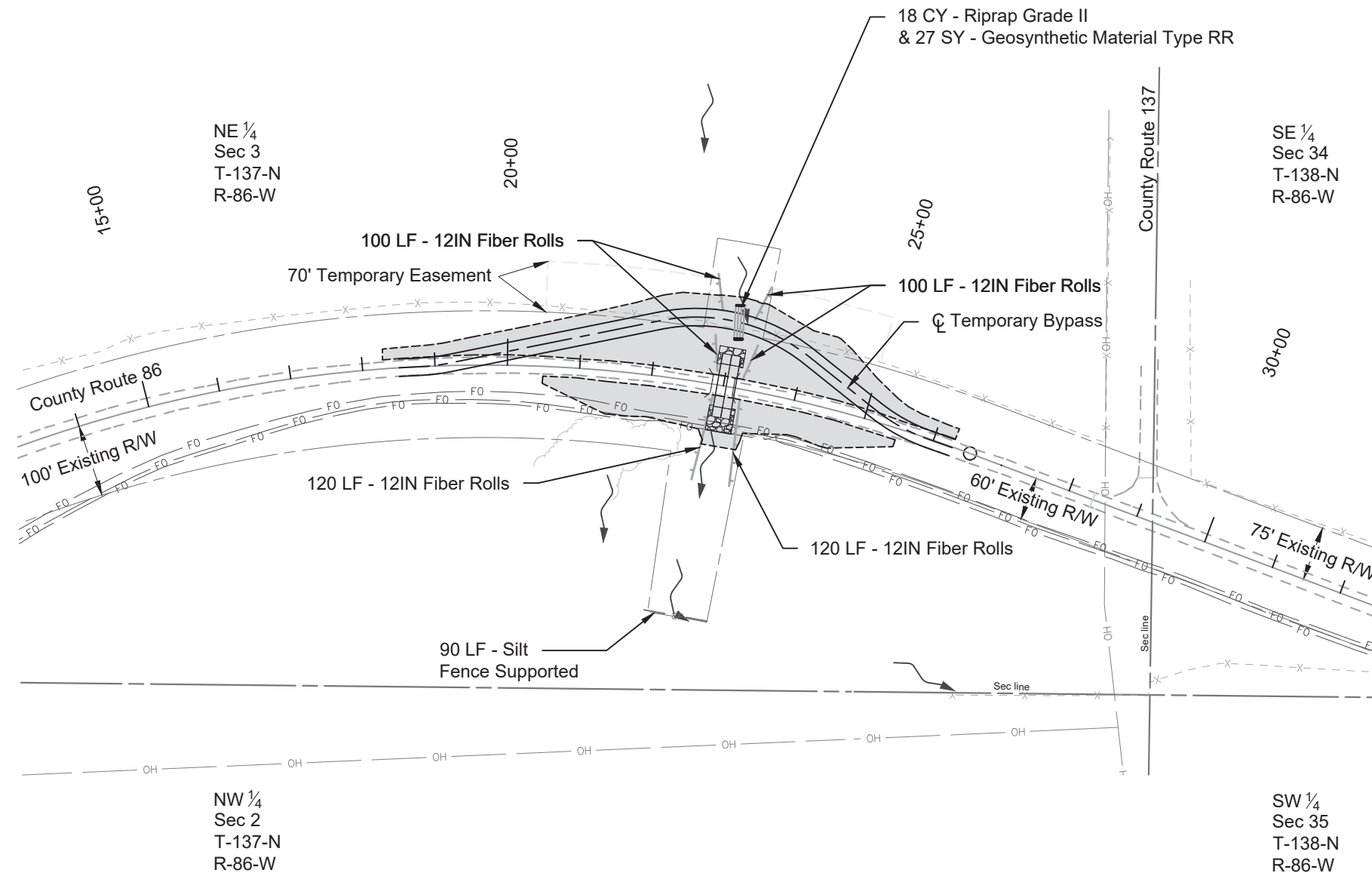


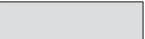
Structure Replacement
Wetland Impacts
Bridge No. 30-128-19.1
Morton County, ND



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	76	1

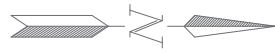
<u>251 2000 TEMPORARY COVER CROP</u>	
Sta. 18+50 to Sta. 26+30	1.2 Acres
<u>253 0101 STRAW MULCH</u>	
Sta. 18+50 to Sta. 26+30	1.6 Acres
<u>256 0200 RIPRAP GRADE II</u>	
Sta. 23+00 Lt	18 CY
<u>260 0200 SILT FENCE SUPPORTED</u>	
Sta. 22+43 Rt	90 LF
<u>260 0201 REMOVE SILT FENCE SUPPORTED</u>	
Sta. 22+43 Rt	90 LF
<u>261 0112 FIBER ROLLS 12IN</u>	
Sta. 22+80 Lt	100 LF
Sta. 22+80 Rt	120 LF
Sta. 23+25 Lt	100 LF
Sta. 23+25 Rt	120 LF
<u>261 0113 REMOVE FIBER ROLLS 12IN</u>	
Sta. 22+80 Lt	100 LF
Sta. 22+80 Rt	120 LF
Sta. 23+25 Lt	100 LF
Sta. 23+25 Rt	120 LF
<u>709 0155 GEOSYNTHETIC MATERIAL TYPE RR</u>	
Sta. 23+00 LT	27 SY



 - Temporary Cover Crop & Straw Mulch (1.55 Acres)

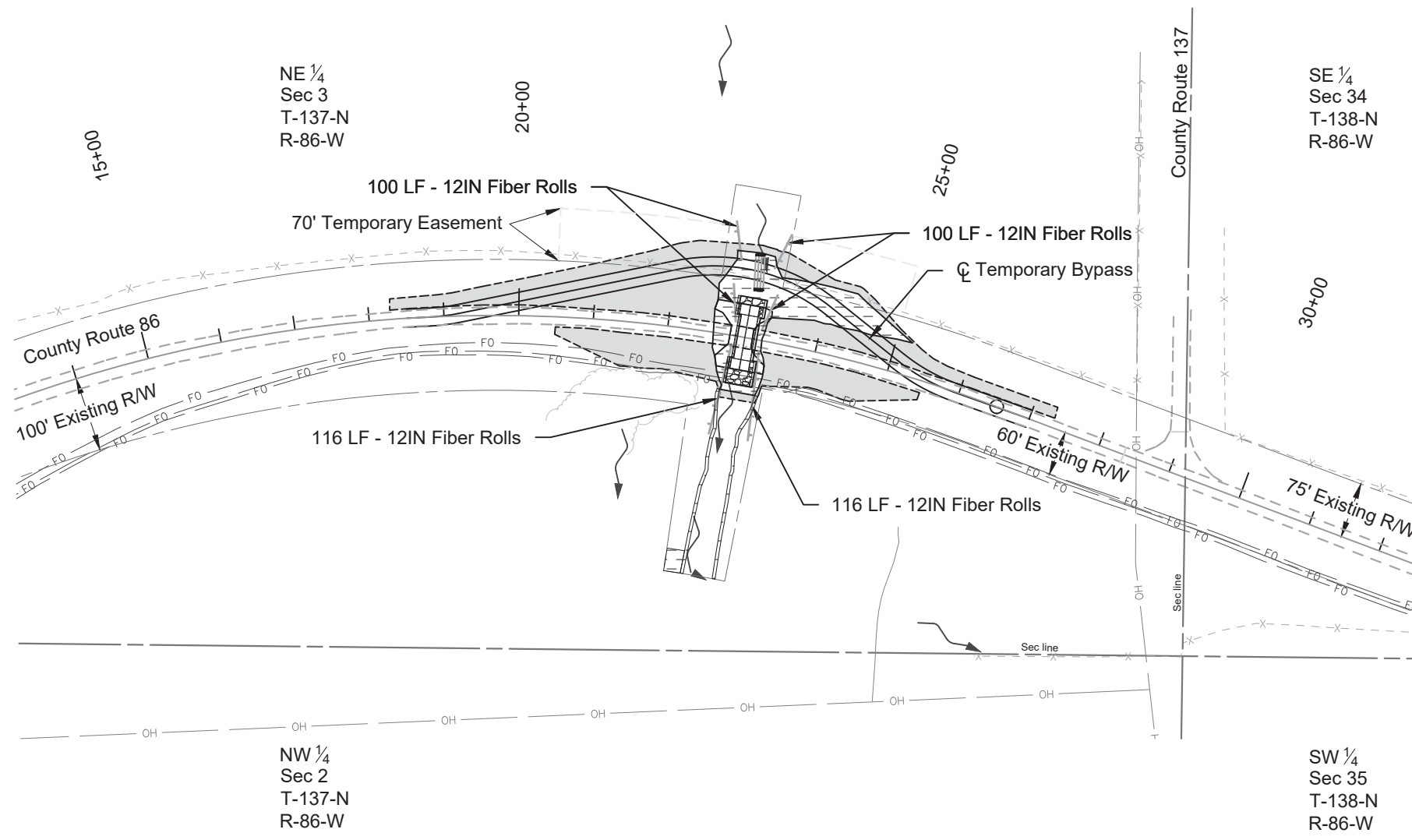


Structure Replacement
 Temporary Erosion Control
 Bridge No. 30-128-19.1
 Morton County, ND



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	77	1

251 0200 SEEDING CLASS II	Sta. 19+00 to Sta. 27+00	1.2 Acres
251 1000 WETLAND SEED	Sta. 23+33 to Sta. 25+20	0.4 Acres
253 0101 STRAW MULCH	Sta. 19+00 to Sta. 27+00	1.6 Acres
261 0112 FIBER ROLLS 12IN	Sta. 22+80 Lt	100 LF
	Sta. 22+80 Rt	120 LF
	Sta. 23+25 Lt	100 LF
	Sta. 23+25 Rt	120 LF



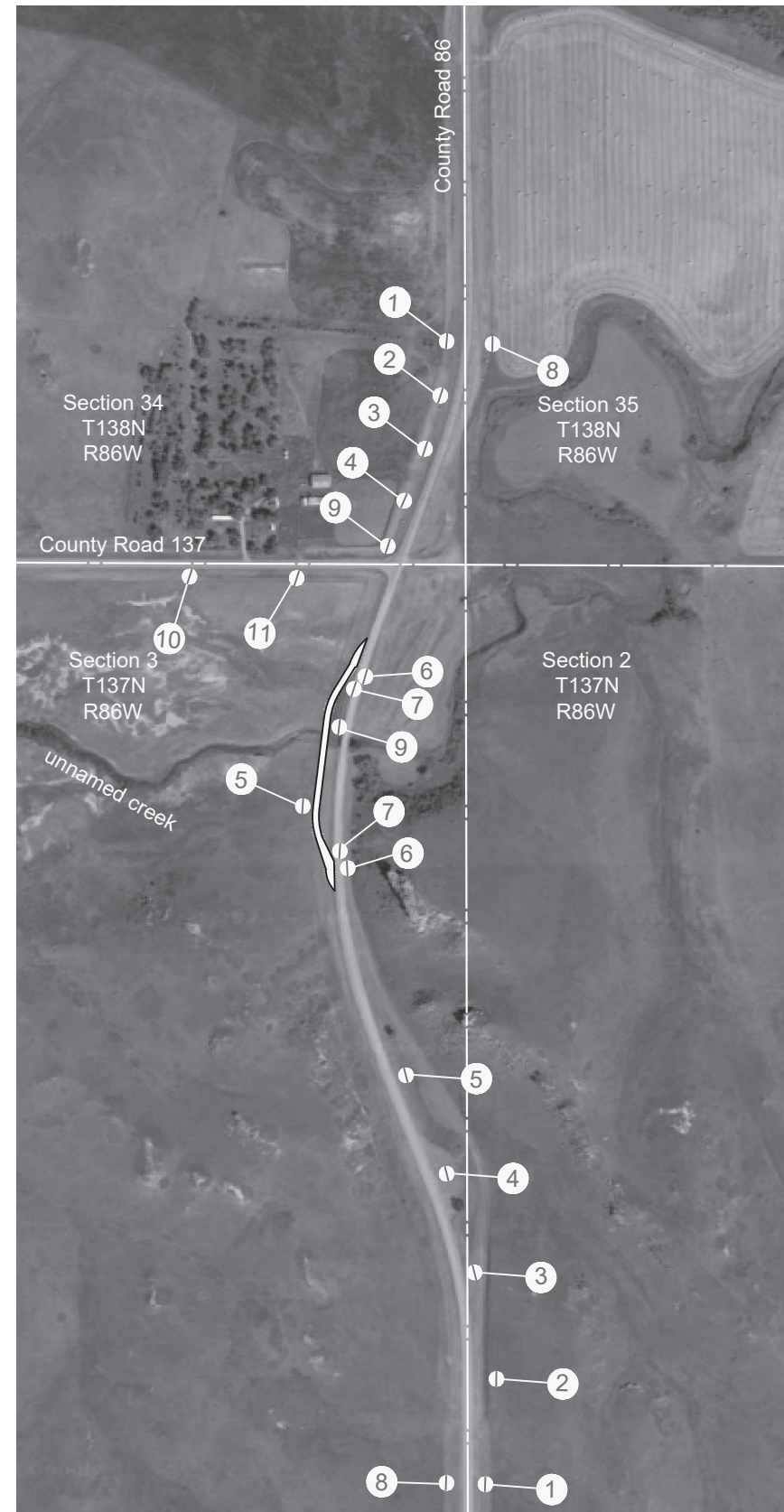
- Seeding Class II (1.23 Acres)
- Wetland Seed (0.40 Acres)



Structure Replacement
 Permanent Erosion Control
 Bridge No. 30-128-19.1
 Morton County, ND



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	100	2



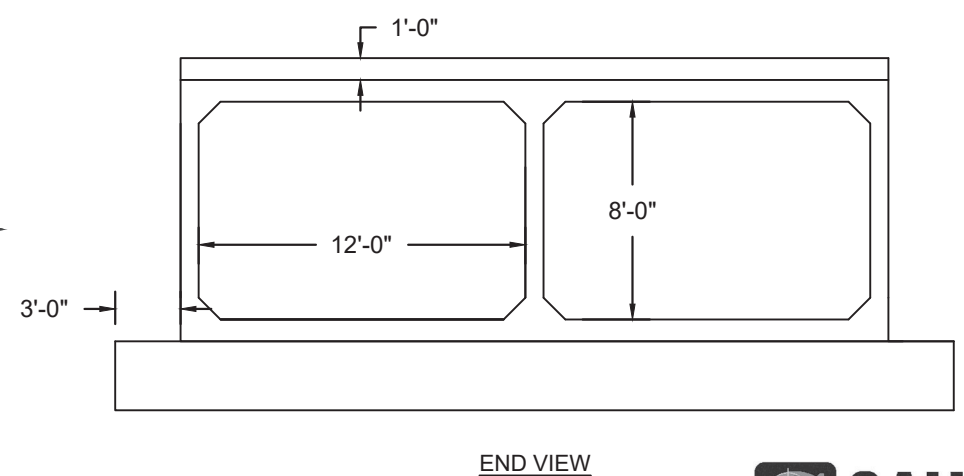
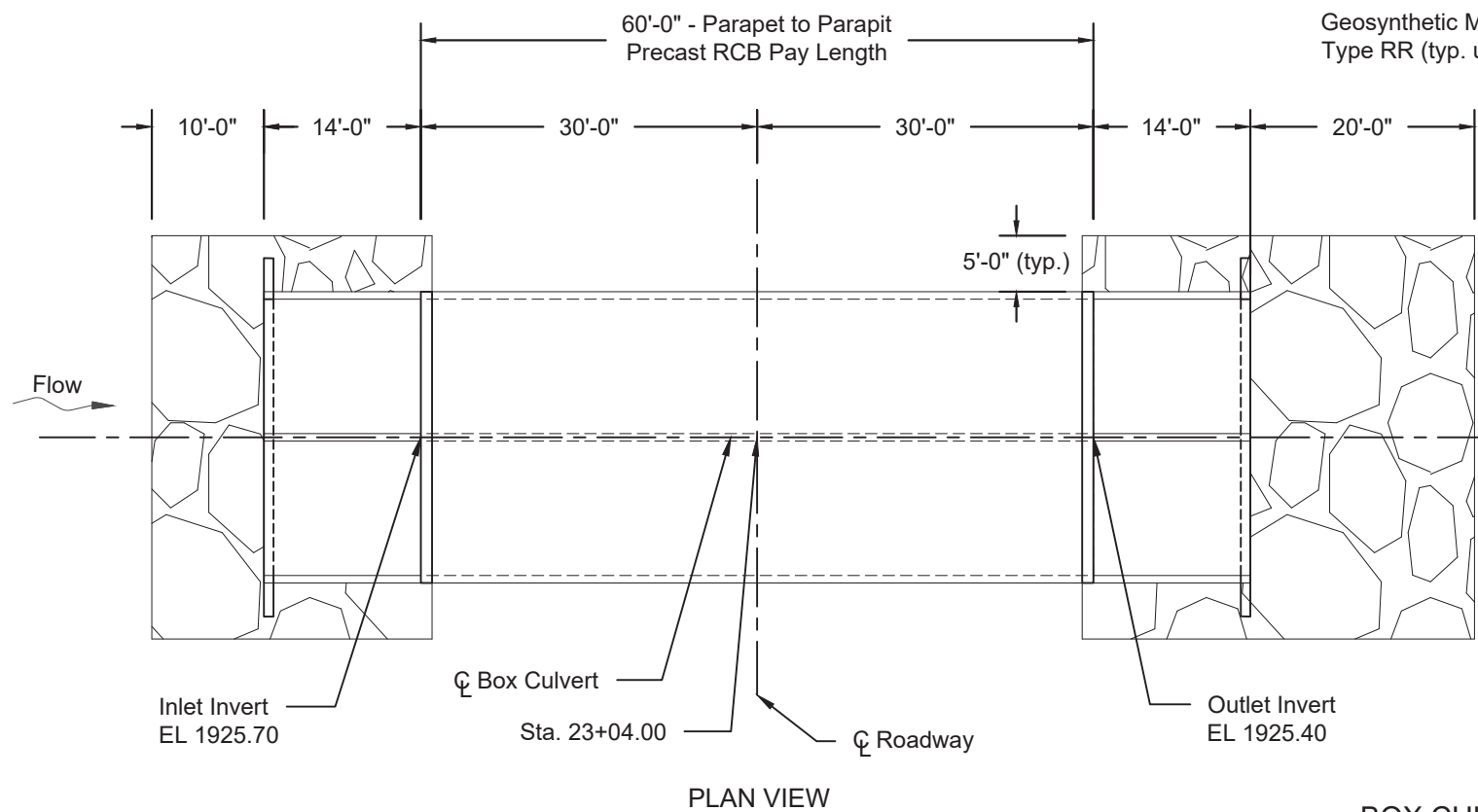
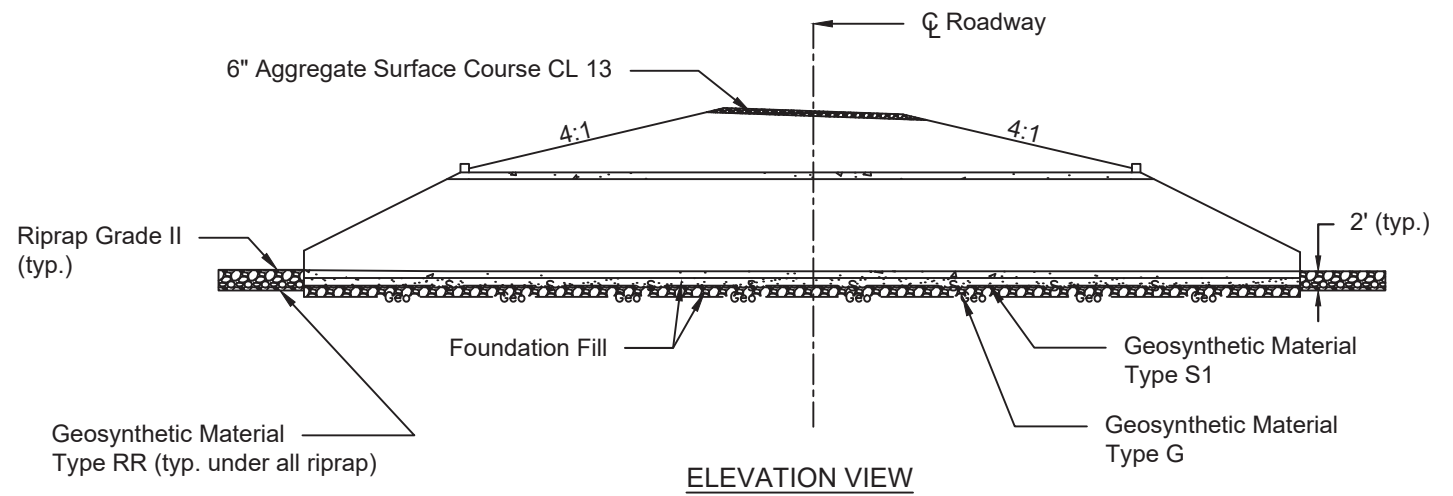
1. W20-1-48 "Road Work 1000 Feet" Post Mounted
2. G20-55-96 "Speed Limit Enforced" Post Mounted
3. W3-5-48 "Speed Reduction Ahead" Post Mounted
4. R2-1-48 "Speed Limit 25 MPH" Post Mounted
5. W1-4(L)-48 "Reverse Curve" Post Mounted
6. R11-2-48 "Road Closed" Barricade Mounted
7. W1-6-48 "Large Arrow" Barricade Mounted
8. G20-2-48 "End Road Work" Post Mounted
9. W1-4(R)-48 "Reverse Curve" Post Mounted
10. W20-1-48 "Road Work Ahead" Post Mounted
11. G20-52a-72 "Road Work next .6 miles Rt arrow" Post Mounted



Structure Replacement
Traffic Control Layout
Bridge No. 30-128-19.1
Morton County, ND

For a double barrel box culvert with a 10" thick roof, 10" floor and 8" walls, the following total factored moments and shears would result from the application of the required loads:

FACTORED DESIGN MOMENTS (DOUBLE)		FACTORED DESIGN SHEARS (DOUBLE)	
WALL MOMENT	1,476 ft-lbs	WALL SHEAR	2,995 lbs
ROOF MOMENTS		ROOF SHEAR	
CORNER	-10,984 ft-lbs	CORNER	8,066 lbs
BOTTOM	26,395 ft-lbs	WALL	11,140 lbs
TOP	-34,111 ft-lbs	FLOOR SHEAR	
FLOOR MOMENTS		CORNER	9,688 lbs
CORNER	-10,872 ft-lbs	WALL	13,692 lbs
TOP	19,588 ft-lbs		
BOTTOM	-36,132 ft-lbs		



HYDRAULIC DATA:

Drainage Area	11.3	sq mi
Stream Gradient	0.0054	ft/ft
Design Frequency	25	yr
Design Discharge	1,150	cfs
Design Headwater Stage	1,934.05	ft
Design Tailwater Stage	1,932.62	ft
Velocity Through Culvert	7.70	fps
100-Year Frequency Discharge	1,840	cfs
100-Year Frequency Headwater	1,936.49	ft
Overtopping Stage	1,936.15	ft
Overtopping Discharge	1790	cfs

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0105	REMOVAL OF STRUCTURE	L SUM	1
210	0109	CLASS 2 EXCAVATION-BOX CULVERT	EA	1
210	0210	FOUNDATION FILL	CY	539
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
256	0200	RIPRAP GRADE II	CY	102
606	3208	DBL 12FT X 8FT PRECAST RCB CULVERT	LF	60
606	7208	DBL 12FT X 8FT PRECAST RCB END SECTION	EA	2
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	303
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	153
709	0161	GEOSYNTHETIC MATERIAL TYPE S1	SY	303

Structure Replacement
 Double 12' X 8' X 60'
 Precast Concrete Box Culvert Layout
 Bridge No. 30-128-19.1

Morton County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	170	2

NOTES

MIX DESIGN

Cement	100 lbs
Fly Ash	300 lbs
Fine Aggregate	2600 lbs
Water	70 gals

- 100-P01 SCOPE OF WORK: Work at this site consists of removing the existing structure and replacing it with a double 12' x 8' x 60' precast reinforced concrete box culvert.
- 202-P01 REMOVAL OF STRUCTURE: The existing structure is a single span bridge 31' long and 24' wide. The superstructure consists of a concrete channel beam with timber abutments.
- 210-P01 CLASS 2 EXCAVATION – BOX CULVERT: Include the costs for all excavation to construct the box culvert including the excavation for the riprap in the bid item "CLASS 2 EXCAVATION – BOX CULVERT".
- 210-P02 FOUNDATION FILL: Place foundation fill in layers not exceeding 6" depth, moisten or dry as required, and compact with mechanical tamping equipment. The quantity for foundation fill was computed to a depth of 2' below the box culvert.

Coarse aggregate meeting the requirements of size 3 aggregate gradation in Table 802-03 of the Standard Specification shall be used in the bottom 1' depth of the Foundation Fill. The cost of the aggregate will not be paid for separately and will be paid for at the bid unit price for "Foundation Fill".
- 210-P03 ORDINARY BACKFILL: Compact material as specified in Section 203.04 G.3.
- 606-P01 PRECAST SECTION: The barrel sections shall be tied together with 1" ø tie bolts as shown on Standard Drawing D-714-22. Each precast reinforced concrete box culvert section shall be secured with four tie bolts per joint. All bolts, plates, angles, and studs shall meet ASTM A36. Nuts shall be heavy hex in conformance with ASTM A563 and washers shall be ASTM F436, Type 1. Welded pipe sleeves shall be ASTM A53, Grade B. All hardware and structural steel shall be galvanized according to Section 854.

Welders shall be properly certified for all shop and field welds. Field welds shall be coated with galvanized according to Section 854.02.

Separate single cell precast units may be used as alternatives to a multi cell culvert. The distance between separate precast units should be a minimum of 3" and a maximum of 1'-0". This gap shall be filled with a controlled density backfill. The controlled density backfill shall be a blend of cement, water, pozzolanic materials, and fillers. The material shall be fluid on placement to flow around and fill voids in the backfill area. The material shall be able to support normal loads after 6 hours and shall have a compressive strength in the range of 75 psi to 125 psi at 28 days. If the mix design shown is used, no further testing will be required. The mix design yields approximately one cubic yard of flowable mortar:

A 12" cap shall be placed on each end of the controlled density backfill. The 12" cap shall consist of weatherproof and freeze/thaw resistant material such as SikagROUT 212, BASF Masterflow® 928, Euclid NS Grout, or an approved equal which complies with ASTM C1107.

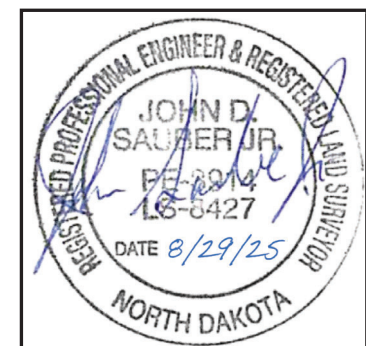
Measurement and Payment: Controlled density backfill including the 12" cap will not be measured separately but shall be included in the price bid for "DBL 12FT X 8FT Precast RCB Culvert".

606-P02 END SECTIONS: The end sections shall include a reinforced concrete parapet on the top of the roof and a reinforced concrete cutoff wall below the floor. The parapet shall be one (1) foot by one (1) foot and shall be as long as the barrel section's outside width. The cutoff walls shall be placed under the end of the end sections and shall be a minimum of one (1) foot thick, and three (3) feet deep. The cutoff shall extend three (3) feet beyond the edges of the outside box culvert walls.

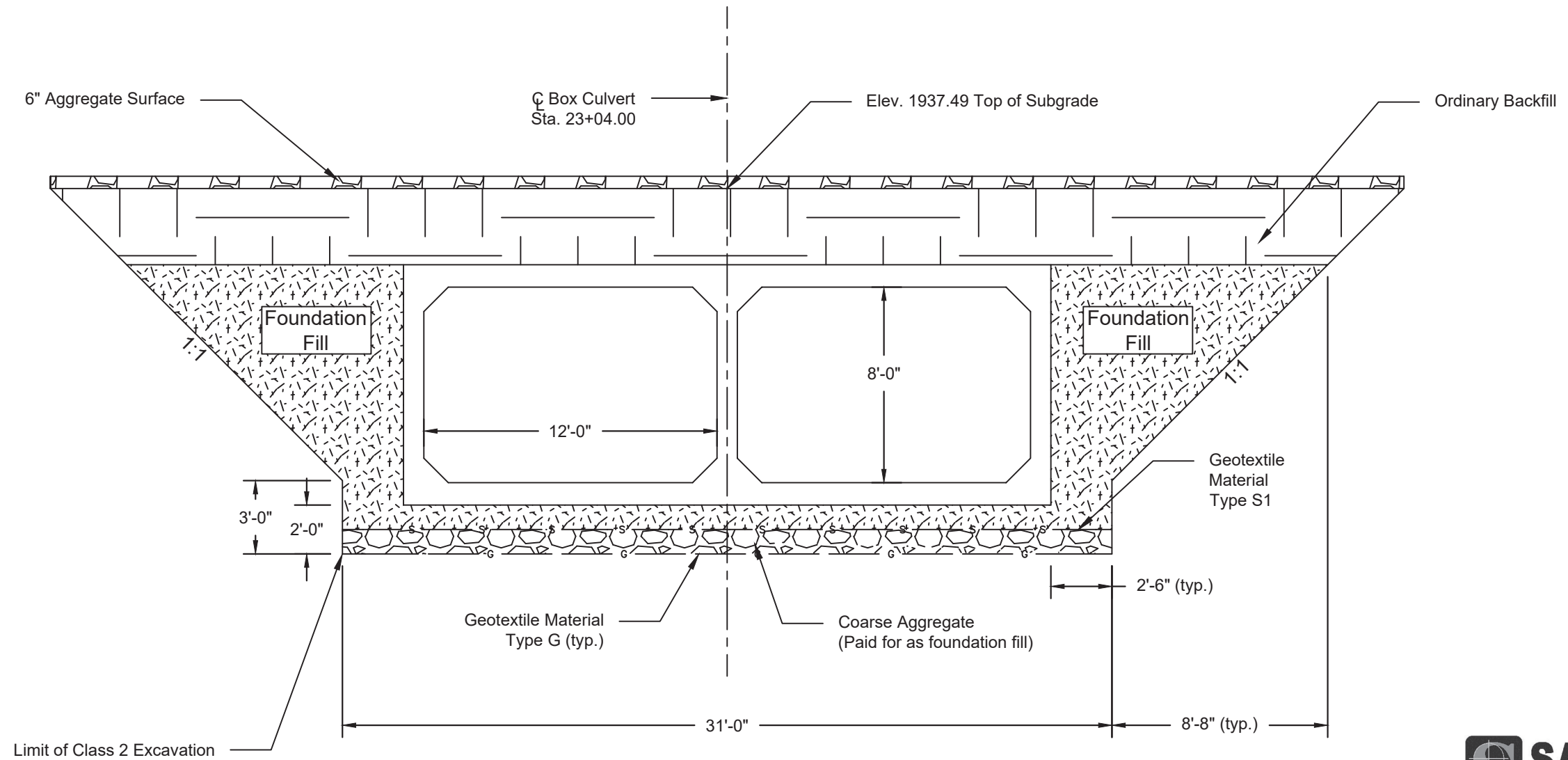
606-P03 PRECAST SECTION DESIGN: Design the precast section in accordance with the AASHTO LRFD Bridge Design Specifications, 8th edition, 2017 and the NDDOT Design Manual, Chapter IV: Structural Design. Use the following loads in the design.

DESIGN LOADS

Fill	1'-6"
Design Load	HL-93



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRC-3027(056)	170	3



GEOSYNTHETIC PLACEMENT AND FOUNDATION FILL
THROUGH EXISTING EMBANKMENT

NOTES:

Provide the top 2" of Foundation fill under the PRCB in accordance with Section 606.E.1.

Place all bedding for entire barrel length prior to placing box culvert sections.



Structure Replacement
Precast Concrete Box Culvert
Excavation & Foundation Fill Detail
Bridge No. 30-128-19.1
Morton County, ND

NDDOT ABBREVIATIONS

D-101-1

? This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.

Abn abandoned
 Abut abutment
 Adj adjusted
 Aggr aggregate
 Ahd ahead
 ARV air release valve
 Align alignment
 Al alley
 Alt alternate
 Alum aluminum
 ADA Americans with Disabilities Act
 & and
 Appr approach
 Approx approximate
 ACP asbestos cement pipe
 Asph asphalt
 AC asphalt cement
 Assmd assumed
 @ at
 Atten attenuation
 ATR automatic traffic recorder
 Ave Avenue
 Avg average
 ADT average daily traffic

C Gdrl cable guardrail
 Calc calculate
 CIP cast iron pipe
 CB catch basin
 CRS cationic rapid setting
 C Gd cattle guard
 C To C center to center
 CL or C centerline
 Ch chain
 Chnlk chain-link
 Ch Blk channel block
 Ch Ch channel change
 Chk check
 Chsld chiseled
 Cir circle
 Cl class
 Clnt clean-out
 Clr clear
 Cl&gr clearing & grubbing
 Comb. combination
 Coml commercial
 Compr compression
 CADD computer aided drafting & design
 Conc concrete
 CECB concrete erosion control blanket
 Cond conductor
 Const construction
 Cont continuous
 CSB continuous split barrel sample
 Contr contraction
 Contr contractor
 CP control point
 Coord coordinate
 Cor corner
 Corr corrected
 CAES corrugated aluminum end section
 CAP corrugated aluminum pipe
 CMES corrugated metal end section
 CMP corrugated metal pipe
 CPVCP corrugated poly-vinyl chloride pipe
 CSES corrugated steel end section
 CSFES corrugated steel flared end section
 CSP corrugated steel pipe
 CSTES corrugated steel traversable end section
 Co County
 Crse course
 Ct Court
 Xarm cross arm
 Xbuck cross buck
 Xsec cross sections
 Xing crossing
 Xrd crossroad
 Crn crown

Culv culvert
 C&G curb & gutter
 CI curb inlet
 CR curb ramp
 C cut
 Dd Ld dead load
 Defl deflection
 Defm deformed
 DInt delineate
 DIntr delineator
 Depr depression
 Desc description
 Det detail
 DWP detectable warning panel
 Dtr detour
 Dia or \emptyset diameter
 Dir direction
 Dist distance
 DM disturbed material
 DB ditch block
 DG ditch grade
 Dbl double
 Dn down
 Dwg drawing
 Dr drive
 Drwy driveway
 DI drop inlet
 D dry density
 Ea each
 Esmt easement
 E East
 EB Eastbound
 Elast elastomeric
 EL electric locker
 E Mtr electric meter
 EVSE electric vehicle supply equipment
 Elec electric/al
 EDM electronic distance meter
 Elev or El elevation
 Ellipt elliptical
 Emb embankment
 Emuls emulsion/emulsified
 ES end section
 Engr engineer
 ESS environmental sensor station
 Eq equal
 Evgr evergreen
 Exc excavation
 Exst existing
 Exp expansion
 Expy Expressway
 E external of curve
 Extru extruded

FOS factor of safety
 Fed Federal
 FP feed point
 Fn fence
 Fn P fence post
 FO fiber optic
 FD field drive
 F fill
 FAA fine aggregate angularity
 FH fire hydrant
 Fl flange
 Flrd flared
 FES flared end section
 F Bcn flashing beacon
 FA flight auger sample
 FL flow line
 Ftg footing
 FM force main
 Fnd found
 Fdn foundation
 Frac fractional
 Frwy freeway
 Frt front
 FF front face
 F Disp fuel dispenser
 FFP fuel filler pipes
 FLS fuel leak sensor
 Furn furnish/ed

Bk back
 BF back face
 Balc balcony
 B Wire barbed wire
 Barr barricade
 Btry battery
 BI beehive inlet
 Beg begin
 BG below grade
 BM bench mark
 Bkwy bikeway
 Bit bituminous
 Blk block
 BH bore hole
 Bot bottom
 Blvd Boulevard
 Bndry boundary
 Brkwy breakaway
 Br bridge
 Bldg building
 Bus. business
 BV butterfly valve
 Byp bypass

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
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04-23-18	General Revisions
09-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions

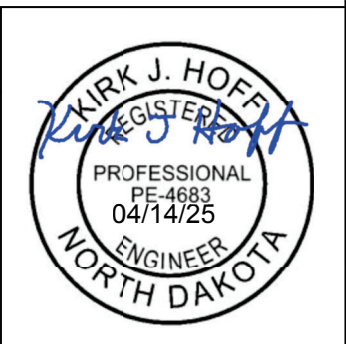


NDDOT ABBREVIATIONS

D-101-2

Galv	galvanized	Ln	lane	Obsc	obscure(d)	Qty	quantity
Gar	garage	Lg	large	Ocpd	occupied	Qtr	quarter
Gs L	gas line	Lat	latitude	Ocpy	occupy		
G Reg	gas line regulator	Lt	left	O/s	offset		
GMV	gas main valve	Lens	lenses	OC	on center	Rad or R	radius
G Mtr	gas meter	Lvl	level	C	one dimensional consolidation	RR	railroad
GSV	gas service valve	Lvng	leveling	OC	organic content	Rlwy	railway
GVP	gas vent pipe	Lht	light	Orig	original	Rsd	raised
GV	gate valve	LP	light pole	O To O	out to out	RC	rapid curing
Ga	gauge	Ltg	lighting	OD	outside diameter	Rec	record
Gov	government	Liq	liquid	OH	overhead	Recy	recycle
Grd	graded/grade	LL	liquid limit			RAP	recycled asphalt pavement
Grnd	ground	Loc	location			RPCC	recycled portland cement concrete
GWM	ground water monitor	Long.	longitude	PMT	pad mounted transformer	Ref	reference
Gdrl	guardrail	Lp	loop	Pg	pages	R Mkr	reference marker
Gtr	gutter	LD	loop detector	Pntd	painted	RM	reference monument
		Lum	luminaire	Pr	pair	RP	reference point
				Pnl	panel	Refl	reflectorized
H Plg	H piling			Pk	park	RCB	reinforced concrete box
Hdwl	headwall	Mb	mailbox	PSD	passing sight distance	RCES	reinforced concrete end section
Ht	height	ML	main line	Pvmt	pavement	RCFES	reinforced concrete flared end section
Hel	helical	MH	manhole	Ped	pedestal	RCP	reinforced concrete pipe
HDPE	high density polyethylene	Mkd	marked	Ped	pedestrian	RCPS	reinforced concrete pipe sewer
HM	high mast	Mkr	marker	PPP	pedestrian pushbutton post	RCTES	reinforced concrete traversable end section
HP	high pressure	Mkg	marking	Pen.	penetration	Reinf	reinforcement
HPS	high pressure sodium	MA	mast arm	Perf	perforated	Res	reservation
HTCG	high tension cable guardrail	Matl	material	Per.	perimeter	Res	residence
Hwy	highway	Max	maximum	Perm	permanent	Ret	retaining
Hor	horizontal			PL	pipeline	Rev	reverse
HBP	hot bituminous pavement	Meas	measure	PI	place	Rt	right
HMA	hot mix asphalt	Mdn	median	P&P	plan & profile	R/W	right of way
Hyd	hydrant	MD	median drain	PL	plastic limit	Riv	river
Ph	hydrogen ion content	MC	medium curing	Pl or \bar{P}	plate	Rd	road
		MGS	Midwest Guardrail System	Pt	point	Rdbd	road bed
		MM	mile marker	PE	polyethylene	Rdwy	roadway
Id	identification	MP	mile post	PVC	polyvinyl chloride	RWIS	roadway weather information system
Incl	inclinometer tube	Min	minimum	PCC	Portland Cement concrete	Rk	rock
IMH	inlet manhole	Misc	miscellaneous	PP	power pole	Rt	route
ID	inside diameter	Mon	monument	Preempt	preemption		
Inst	instrument	Mnd	mound	Prefab	prefabricated		
Intchg	interchange	Mtbl	mountable	Prfmd or Pref	performed		
Intmdt	intermediate	Mtd	mounted	Prep	preparation		
Intscn	intersection	Mtg	mounting	Press.	pressure		
Inv	invert	Mk	muck	PRV	pressure relief valve		
IP	iron pipe			Prestr	prestressed		
				Pvt	private		
				PD	private drive		
Jt	joint	Neop	neoprene	Prod.	production/produce		
Jct	junction	Ntwk	network	Prog	programmed		
		N	North	Prop.	property		
		NE	Northeast	Ppsd	proposed		
		NW	Northwest	PB	pull box		
		NB	Northbound				
		No. or #	number				

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
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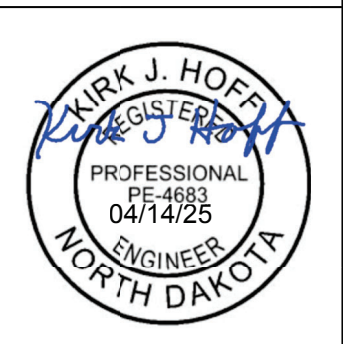


NDDOT ABBREVIATIONS

D-101-3

Salv	salvage(d)	Tel	telephone
San	sanitary sewer line	Tel B	Telephone Booth
Sec	section	Tel P	telephone pole
SL	section line	Tv	television
Sep	separation	Temp	temperature
Seq	sequence	Temp	temporary
Serv	service	TBM	temporary bench mark
Sht	sheet	T	thinwall tube sample
Shtng	sheeting	Ts	topsoil
Shldr	shoulder	Traf	traffic
Sw or Sdwk	sidewalk	TSCB	traffic signal control box
SD	sight distance	Tr	trail
SN	sign number	Transf	transformer
Stg	signal	Trans	transition
Sgl	single	TT	transmission tower
SRCP	slotted reinforced concrete pipe	TES	traversable end section
SC	slow curing	Trans	transverse
SS	slow setting	Trtd	treated
Sm	small	Trmt	treatment
S	South	Qc	triaxial compression
SE	Southeast	TERO	tribal employment rights ordinance
SW	Southwest	Tpl	triple
SB	Southbound	Typ	typical
Sp	spaces		
Spcl	special	Qu	unconfined compressive strength
SA	special assembly	Ugrnd	underground
SP	special provisions	Util	utility
G	specific gravity		
Spk	spike	VG	valley gutter
SB	split barrel sample	Vap	vapor
SH	sprinkler head	Vert	vertical
SV	sprinkler valve	VCP	vitrified clay pipe
Sq	square	Vol	volume
Stk	stake	VSFS	vehicle speed feedback sign
Std	standard		
N	standard penetration test	Wkwy	walkway
Std Specs	standard specifications	W	water content
Stm L	steam line	WGV	water gate valve
SEC	steel encased concrete	WL	water line
SMA	stone matrix asphalt	WM	water main
SSD	stopping sight distance	WMV	water main valve
SD	storm drain	W Mtr	water meter
St	street	WSV	water service valve
SPP	structural plate pipe	WW	water well
SPPA	structural plate pipe arch	Wrng	wearing
Str	structure	WIM	weigh in motion
Subd	subdivision	W	west
Sub	subgrade	WB	westbound
Sub Prep	subgrade preparation	Wrng	wiring
Ss	subsoil	W/	with
SS	supplement specification	W/o	without
Supp	supplemental		
Surf	surfacing		
Surv	survey		
Sym	symmetrical		

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08-16-22	General Revisions
04-14-25	General Revisions



NDDOT ABBREVIATIONS

D-101-4

MEASUREMENTS

ac acres
 A ampere
 Bd Ft board feet
 Cd candela
 cm centimeter
 C coulomb
 CF cubic feet
 m3 cubic meter
 m3/s cubic meters per second
 CY cubic yard
 CY/mi cubic yards per mile
 D or Deg degree
 F Fahrenheit
 F farad
 ft feet/foot
 Gal gallon
 G giga
 Ha hectare
 H henry
 Hz hertz
 hr hour(s)
 in. inch
 J joule
 K kelvin
 kN kilo newton
 kPa kilo pascal
 kg kilogram
 kg/m3 kilogram per cubic meter
 km kilometer
 K Kip(s)
 LF linear foot
 L litre
 Lm lumen
 L sum lump sum
 Lx lux
 M Hr man hour
 M mega
 m meter
 m/s meters per second
 mi mile
 mL milliliter
 mm millimeter
 mm/hr millimeters per hour
 n nano
 N newton
 Pa pascal
 lb pounds
 sec seconds
 S siemens
 SF square feet
 km2 square kilometer
 m2 square meter
 SY square yard
 Sta Yd station yards
 SI Systems International

T tesla
 T/mi tons per mile
 V volt
 W watt
 Wb weber

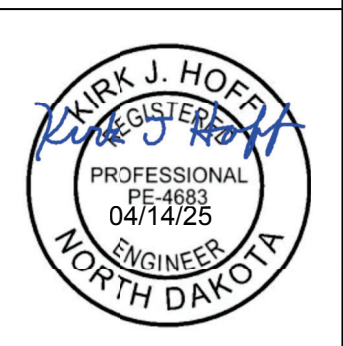
SURVEY DESCRIPTIONS

Az azimuth
 Bs backsight
 Brg bearing
 BP Cap blue plastic cap
 BS both sides
 BC brass cap
 CC closing corner
 CS curve to spiral
 Eq equation
 E external of curve
 FS far side
 FB field book
 Fs foresight
 Geod geodetic
 GIS Geographical Information System
 GPS Global Positioning System
 HI height of instrument
 IM iron monument
 I Pn iron pin
 LS Land Surveyor (licensed)
 LSIT Land Surveyor In Training
 L length of curve
 LC long chord
 LB level book
 MC meander corner
 Mer meridian
 M mid ordinate of curve
 NGS National Geodetic Survey
 NS near side
 Obsn observation
 Off Loc office location
 OP Cap orange plastic cap
 PK Parker-Kalon nail
 P Cap plastic cap
 PP Cap pink plastic cap
 PCC point of compound curve
 PC point of curve
 PI point of intersection
 PRC point of reverse curvature
 PT point of tangent
 POC point on curve
 POT point on tangent
 RTP random traverse point
 Rge range
 RP Cap red plastic cap
 SC spiral to curve
 SC standard corner
 ST spiral to tangent
 Sta station
 SE superelevation
 Tan tangent
 T tangent (semi)
 TS tangent to spiral
 Twp township
 TB transit book
 TP traverse point
 TP turning point
 USC&G US Coast & Geodetic Survey
 USGS US Geologic Survey
 VC vertical curve
 WC witness corner
 WGS World Geodetic System
 YP Cap yellow plastic cap
 Z zenith

SOIL TYPES

Cl clay
 Cl F clay fill
 Cl Hvy clay heavy
 Cl Lm clay loam
 Co S coal slack
 C Gr coarse gravel
 CS coarse sand
 FS fine sand
 Gr gravel
 Lig Co lignite coal
 Lig Sl lignite slack
 Lm loam
 Rk rock
 Sd sand
 Sdy Cl sandy clay
 Sdy Cl Lm sandy clay loam
 Sdy Fl sandy fill
 Sdy Lm sandy loam
 Sc scoria
 Sh shale
 Si Cl silt clay
 Si Cl Lm silty clay loam
 Si Lm silty loam

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	Sheet Added
4-14-25	- Continued from D-101-3 General Revisions



NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM 702 Communications
 ACCENT Accent Communications
 AGASSIZ WU Agassiz Water Users District
 AGC Associated General Contractors of America
 ALL PL Alliance Pipeline
 ALL SEAS WU All Seasons Water Users District
 AMOCO PI Amoco Pipeline Company
 AMRDA HESS Amerada Hess Corporation
 AT&T AT&T Corporation
 B PAW Bear Paw Energy Incorporated
 BAKER ELEC Baker Electric
 BASIN ELEC Basin Electric Cooperative Incorporated
 BEK TEL Bek Communications Cooperative
 BELLE PL Belle Fourche Pipeline Company
 BLM Bureau of Land Management
 BNSF Burlington Northern Santa Fe Railway
 BOEING Boeing
 BRNS RWD Barnes Rural Water District
 BURK-DIV ELEC Burke-Divide Electric Cooperative
 BURL WRD Burleigh County Water Resource District
 CABLE ONE Cable One
 CABLE SERV Cable Services
 CAP ELEC Capital Electric Cooperative Incorporated
 CASS CO ELEC Cass County Electric Cooperative
 CASS RWU Cass Rural Water Users District
 CAV ELEC Cavalier Rural Electric Cooperative
 CBLCOM Cablecom Of Fargo
 CENEX PL Cenex Pipeline
 CENT PL WATER DIST Central Pipe Line Water District
 CENT PWR ELEC Central Power Electric Cooperative
 CENTURYLINK CenturyLink
 COE Corps of Engineers
 CONS COMM Consolidated Communications
 CONS TELCOM Consolidated Telcom
 CONT RES Continental Resource Inc
 CPR Canadian Pacific Railway
 D O E Department Of Energy
 DAK CARR Dakota Carrier Network
 DAK CENT TEL Dakota Central Telephone
 DAK RWD Dakota Rural Water District
 DGC Dakota Gasification Company
 DICKEY R NET Dickey Rural Networks
 DICKEY WRD Dickey County Water Resource District
 DICKEY TEL Dickey Telephone
 DNRR Dakota Northern Railroad
 DOME PL Dome Pipeline Company
 DVELEC Dakota Valley Electric Cooperative
 DVMW Dakota, Missouri Valley & Western
 E CENT REG WD East Central Water District
 ENBRDG Enbridge Pipelines Incorporated
 ENVENTIS Enventis Telephone
 EQUINOR Equinor Pipeline
 FALK MNG Falkirk Mining Company
 FHWA Federal Highway Administration
 G FKS-TRL WD Grand Forks-traill Water District
 GETTY TRD & TRAN Getty Trading & Transportation
 GLDN W ELEC Golden West Electric Cooperative

GTR RAMSEY WD Greater Ramsey Water District
 GT PLNS NAT GAS Great Plains Natural Gas Company
 HALS TEL Halstad Telephone Company
 IDEA1 Idea1
 INT-COMM TEL Inter-Community Telephone Company
 KANEB PL Kaneb Pipeline Company
 KEM ELEC Kem Electric Cooperative Incorporated
 KOCH GATH SYS Koch Gathering Systems Incorporated
 LKHD PL Lakehead Pipeline Company
 LWR YELL R ELEC Lower Yellowstone Rural Electric
 LUMEN Lumen Technologies Incorporated
 MCKNZ CON McKenzie Consolidated Telcom
 MCKNZ ELEC McKenzie Electric Cooperative
 MCKNZ WRD McKenzie County Water Resource District
 MCLEOD McLeod USA
 MCLN ELEC McLean Electric Cooperative
 MCLN-SHRDN R WAT McLean-Sheridan Rural Water District
 MDU Montana-dakota Utilities
 MIDCO MidContinent Communications
 MIDSTATE TEL Midstate Telephone Company
 MINOT CABLE Minot Cable Television
 MINOT TEL Minot Telephone Company
 MISS VALL COMM Missouri Valley Communications Incorporated
 MISS W W S Missouri West Water System
 MNKOTA PWR Minnkota Power
 MOR-GRAN-SOU ELEC Mor-gran-sou Electric Cooperative
 MOUNT-WILLI ELEC Mountrail-williams Electric Cooperative
 MLGC Moore & Liberty - Griggs County
 MUNICIPAL City Water And Sewer
 MUNICIPAL City Of '.....'
 N CENT ELEC North Central Electric Cooperative
 N PRAIR REG WD North Prairie Regional Water District
 ND PKS & REC North Dakota Parks And Recreation
 ND TEL North Dakota Telephone Company
 NDDOT North Dakota Department of Transportation
 NE REG WD Northeast Regional Water District
 NDSU SOIL SCI DEPT NDSU Soil Science Department
 NEMONT TEL Nemont Telephone
 NODAK R ELEC Nodak Rural Electric Cooperative
 NOON FRMS TEL Noonan Farmers Telephone Company
 NPR Northern Plains Railroad
 NSP Northern States Power
 NTHN BRDR PL Northern Border Pipeline
 NTHN PLNS ELEC Northern Plains Electric Cooperative Incorporated
 NTHWSTRN REF Northwestern Refinery Company
 NW COMM Northwest Communication Cooperation
 NWRWD Northwest Rural Water District
 ONEOK Oneok gas
 OSHA Occupational Safety and Health Administration
 OTTR TL PWR Otter Tail Power Company
 PAAP Plains All American Pipeline
 P L E M Prairielands Energy Marketing
 POLAR COM Polar Communications
 PVT ELEC Private Electric
 QWEST Qwest Communications
 R&T REG WD R & T Water District

RED RIV COMM Red River Communications
 RESVTN TEL Reservation Telephone
 ROBRTS TEL Roberts Company Telephone
 R-RIDER ELEC Roughrider Electric Cooperative
 RRVW Red River Valley & Western Railroad
 S CENT REG WD South Central Regional Water District
 SE W U Southeast Water Users Incorporated
 SCOTT CABLE Scott Cable Television Dickinson
 SHERDN ELEC Sheridan Electric Cooperative
 SHEYN VLY ELEC Sheyenne Valley Electric Cooperative
 SKYTECH Skyland Technologies Incorporated
 SLOPE ELEC Slope Electric Cooperative Incorporated
 SOURIS RIV TELCOM Souris River Telecommunications
 ST WAT COMM State Water Commission
 STATE LN WATER State Line Water Cooperative
 STER ENG Sterling Energy
 STUT RWD Stutsman Rural Water District
 SW PL PRJ Southwest Pipeline Project
 SWWA Southwest Water Authority
 SUNOCO Sunoco LP
 T M C Turtle Mountain Communications
 TCI TCI of North Dakota
 TESORO HGH PLNS PL Tesoro High Plains Pipeline
 TRI-CNTY WU Tri-County Water Users Incorporated
 TRL CO WRD Traill County Water Resource District
 UNTD TEL United Telephone
 UPPR SOUR WD Upper Souris Water District
 US SPRINT U.S. Sprint
 USAF MSL CABLE U.S.A.F. Missile Cable
 USFWS US Fish and Wildlife Service
 USW COMM U.S. West Communications
 VRNDRY ELEC Verendrye Electric Cooperative
 W RIV TEL West River Telephone Incorporated
 WAPA Western Area Power Administration
 WAWSA Western Area Water Supply Authority
 WEB W. E. B. Water Development Association
 WILLI WRD Williams County Water Resource District
 WILSTN BAS PL Williston Basin Interstate Pipeline Company
 WLSH RWD Walsh Water Rural Water District
 WOLVRTN TEL Wolverton Telephone
 XLENER Xcel Energy
 YSVR Yellowstone Valley Railroad

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
05-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions



LINE STYLES

D-101-20

Existing Topography

- Existing Ground Void
- Existing Cemetery Boundary
- Existing Box Culvert Bridge
- Existing Concrete Surface
- Existing Drainage Structure
- Existing Gravel Surface
- Existing Riprap
- Existing Dirt Surface
- Existing Asphalt Surface
- Existing Tie Point Line
- Existing Railroad Centerline
- Existing Guardrail Cable
- Existing Guardrail Metal
- Existing Edge of Water
- Existing Fence
- Existing Railroad
- Existing Field Line
- Exst Flow
- Existing Curb
- Existing Valley Gutter
- Existing Driveway Gutter
- Existing Curb and Gutter
- Existing Mountable Curb and Gutter

Proposed Topography

- Existing 3-Cable w Posts
- Site Boundary
- Existing Berm, Dike, Pit, or Earth Dam
- Existing Ditch Block
- Existing Tree Boundary
- Existing Brush or Shrub Boundary
- Existing Retaining Wall
- Existing Planter or Wall
- Existing W-Beam Guardrail with Posts
- Existing Railroad Switch
- Gravel Pit - Borrow Area
- Existing Wet Area-Vegetation Break
- Existing High Tension Cable Guardrail
- Existing High Tension Cable Guardrail with Posts
- 3-Cable w Posts
- Flow
- Fence
- Remove Line
- Wall
- Retaining Wall (Plan View)
- W-Beam w Posts
- High Tension Cable Guardrail with Posts

Existing Utilities

- Existing Electrical
- Existing Fiber Optic Line
- Existing TV Fiber Optic
- Existing Gas Pipe
- Existing Overhead Utility Line
- Existing Power
- Existing Fuel Pipeline
- Existing Undefined Above Ground Pipe Line
- Existing Sanitary Sewer
- Existing Sanitary Force Main
- Existing Storm Drain
- Existing Storm Drain Force Main
- Existing Culvert
- Existing Telephone Line
- Existing TV Line
- Existing Water or Steam Line
- Existing Under Drain
- Existing Slotted Drain
- Existing Conduit
- Existing Conductor
- Existing Down Guy Wire Down Guy
- Existing Underground Vault or Lift Station

Proposed Utilities

- 24 Inch Pipe
- Reinforced Concrete Pipe
- Under Drain
- Edge Drain

Traffic Utilities

- Conductor
- Fiber Optic
- Existing Loop Detector
- Existing Double Micro Loop Detector
- Micro Loop Detector Double
- Existing Micro Loop Detector
- Micro Loop Detector
- Signal Head with Mast Arm
- Existing Signal Head with Mast Arm

Sign Structures

- Existing Overhead Sign Structure
- Existing Overhead Sign Structure Cantilever
- Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14 REVISIONS	
DATE	CHANGE
09-23-16	Added and Revised Items, Organized by Functional Groups General Revisions
12-18-20	



LINE STYLES

D-101-21

Right Of Way

- Easement
- Existing Easement
- Right of Way
- Existing Right of Way
- Existing Right of Way Railroad
- Existing Right of Way Not State Owned
- Existing Government Lot Line
- Existing Adjacent Block Lines
- Existing Adjacent Lot Lines
- Existing Adjacent Property Line
- Existing Adjacent Subdivision Lines
- Sight Distance Triangle Line
- Dimension Leader

Boundary Control

- ////// Existing City Corporate Limits or Reservation Boundary
- Existing State or International Line
- Existing Township
- Existing County
- Existing Section Line
- Existing Quarter Section Line
- Existing Sixteenth Section Line
- Existing Centerline
- Tangent Line

Cross Sections and Typical

- Existing Ground
- Existing Topsoil (Cross Section View)
- void - void - void - v Existing Ground Void (Not Surveyed)
- Existing Concrete
- Existing Aggregate (Cross Section View)
- Existing Curb and Gutter (Cross Section View)
- Existing Asphalt (Cross Section View)
- Existing Reinforcement Rebar

Geotechnical

- D ----- D ----- Geotextile Fabric Type D
- **Geo** ----- **Geo** ----- Geogrid
- R ----- R ----- Geotextile Fabric Type R
- R ----- R ----- Geotextile Fabric Type R1
- RR ----- RR ----- Geotextile Fabric Type RR
- S ----- S ----- Geotextile Fabric Type S

Countours

- Depression Contours
- Supplemental Contour

Profile

- Subgrade, Subcut or Ditch Grade
- Topsoil Profile

Striping

- Centerline Pavement Marking
- ===== Barrier with Centerline Pavement Marking
- ===== Barrier Pavement Marking
- - - - - Stripe 4 IN Dotted Extension White
- - - - - Stripe 8 IN Dotted Extension White
- - - - - Stripe 8 IN Lane Drop

Pavement Joints

- ===== Doweled Joint
- +++++ Tie Bar 30 Inch 4 Foot Center to Center
- +++++ Tie Bar 18 Inch 3 Foot Center to Center
- +++++ Tie Bar at Random Spacing

Bridge Details

- Small Hidden Object
- Large Hidden Object
- Phantom Object
- Existing Conditions Object
- Centerline Main
- Centerline Secondary
- Excavation Limits
- Proposed Ground
- ===== Sheet Piling

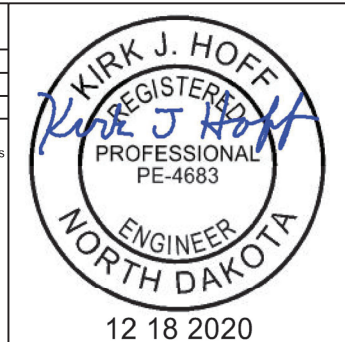
Erosion Control

- Limits of Const Transition Line
- Bale Check
- Rock Check
- s ----- s ----- Floating Silt Curtain
- SF ----- SF ----- Silt Fence
- Excavation Limits
- Fiber Rolls

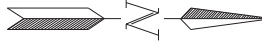




























Environmental

- Wetland Mitigation
- Existing Wetland Easement USFWS
- Existing Wetland Jurisdictional
- Existing Wetland
- Tree Row


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions



SYMBOLS

	North Arrow (Half Scale)		Existing Bush or Shrub		Continuous Split Barrel Sample
	Alignment Data Point		Existing Large Evergreen Tree		Flight Auger Sample
	Alignment Monument		Existing Small Evergreen Tree		Split Barrel Sample
	Spot Elevation		Existing Large Tree		Thinwall Tube Sample
	Existing Miscellaneous Spot		Existing Small Tree		Standard Penetration Test
	Existing Access Control Arrow		Existing Tree Trunk		Inclinometer Tube
	Existing Benchmark		Cairn or Stone Circle		Excavation Unit
	Reset USGS Marker		Existing Artifact		Existing Ground Water Well Bore Hole
	Iron Monument Found		Existing Satellite Dish		
	Iron Pin R/W Monument		Existing Weather Station		
	Property Corner		Existing Windmill or Tower		
	Iron Pin Reference Monument		Reinforced Pavement		
	Right of Way Marker (Exst, Ppsd, Reset)				
	Existing Federal Reference Corner				
	Existing Section Corner (Full, Quarter, Sixteenth, Meander)				
	Existing Witness Corner				
	Existing Control Point (CP, GPS-RTK, TRI)				
	Existing Traverse PI Aerial Panel				
	Existing Reference Marker Point NGS				
	Existing EFB Misc				




















































NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions



12 18 2020

SYMBOLS

D-101-32

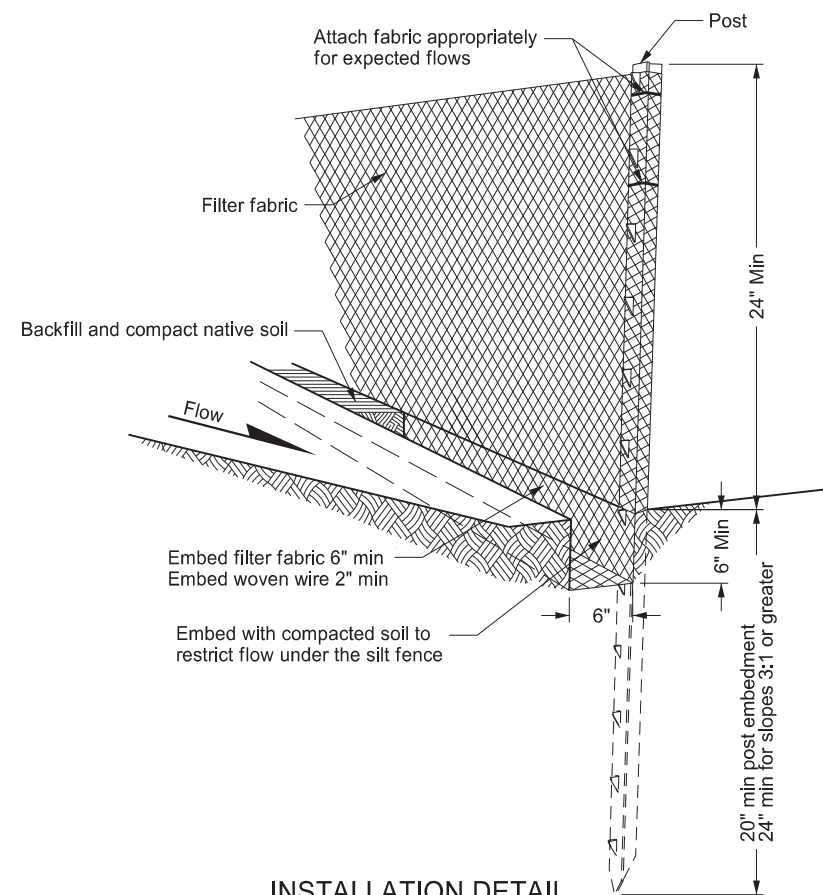
	Existing Luminaire		High Mast Light Standard 3 Luminaire (Exst, Ppsd)		Existing Traffic Signal Standard
	Luminaire LED		High Mast Light Standard 4 Luminaire (Exst, Ppsd)		Pull Box (Exst-Ppsd-Undefined)
	Existing Light Standard Luminaire		High Mast Light Standard 5 Luminaire (Exst, Ppsd)		Intelligent Transportation Pull Box (Exst, Ppsd)
	Relocate Light Standard		High Mast Light Standard 6 Luminaire (Exst, Ppsd)		Transformer (Exst, Ppsd)
	Light Standard Light LED Luminaire		High Mast Light Standard 7 Luminaire (Exst, Ppsd)		Power Pole (Exst-Ppsd-with Transformer)
	Light Standard 35 Watt High Pressure Sodium Vapor Luminaire		High Mast Light Standard 8 Luminaire (Exst, Ppsd)		Wood Pole (Exst, Ppsd)
	Light Standard 50 Watt High Pressure Sodium Vapor Luminaire		High Mast Light Standard 9 Luminaire (Exst, Ppsd)		Pedestrian Push Button Post (Exst, Ppsd)
	Light Standard 70 Watt High Pressure Sodium Vapor Luminaire		High Mast Light Standard 10 Luminaire (Exst, Ppsd)		Existing Pole
	Light Standard 100 Watt High Pressure Sodium Vapor Luminaire		Overhead Sign Structure Load Center (Exst, Ppsd)		Existing Telephone Pole
	Light Standard 150 Watt High Pressure Sodium Vapor Luminaire		Traffic Signal Controller (Exst, Ppsd)		Existing Post
	Light Standard 200 Watt High Pressure Sodium Vapor Luminaire		Pad Mounted Traffic Signal Controller (Exst, Ppsd)		Connection Conductor (Ground, Neutral, Phase 1, Phase 2)
	Light Standard 250 Watt High Pressure Sodium Vapor Luminaire		Flashing Beacon (Exst, Ppsd)		
	Light Standard 310 Watt High Pressure Sodium Vapor Luminaire		Concrete Foundation (Exst, Ppsd)		
	Light Standard 400 Watt High Pressure Sodium Vapor Luminaire		Pipe Mounted Flasher (Exst, Ppsd)		
	Light Standard 700 Watt High Pressure Sodium Vapor Luminaire		Pad Mounted Feed Point (Exst, Ppsd)		
	Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire		Pipe Mounted Feed Point with Pad (Exst, Ppsd)		
	Emergency Vehicle Detector		Pole Mounted Feed Point (Exst, Ppsd)		
	Video Detection Camera		Junction Box (Exst, Ppsd)		
			Existing Pedestrian Head with Number		
			Existing Signal Head		
			Pole Mounted Head		
			Existing Lighting Standard Pole		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions



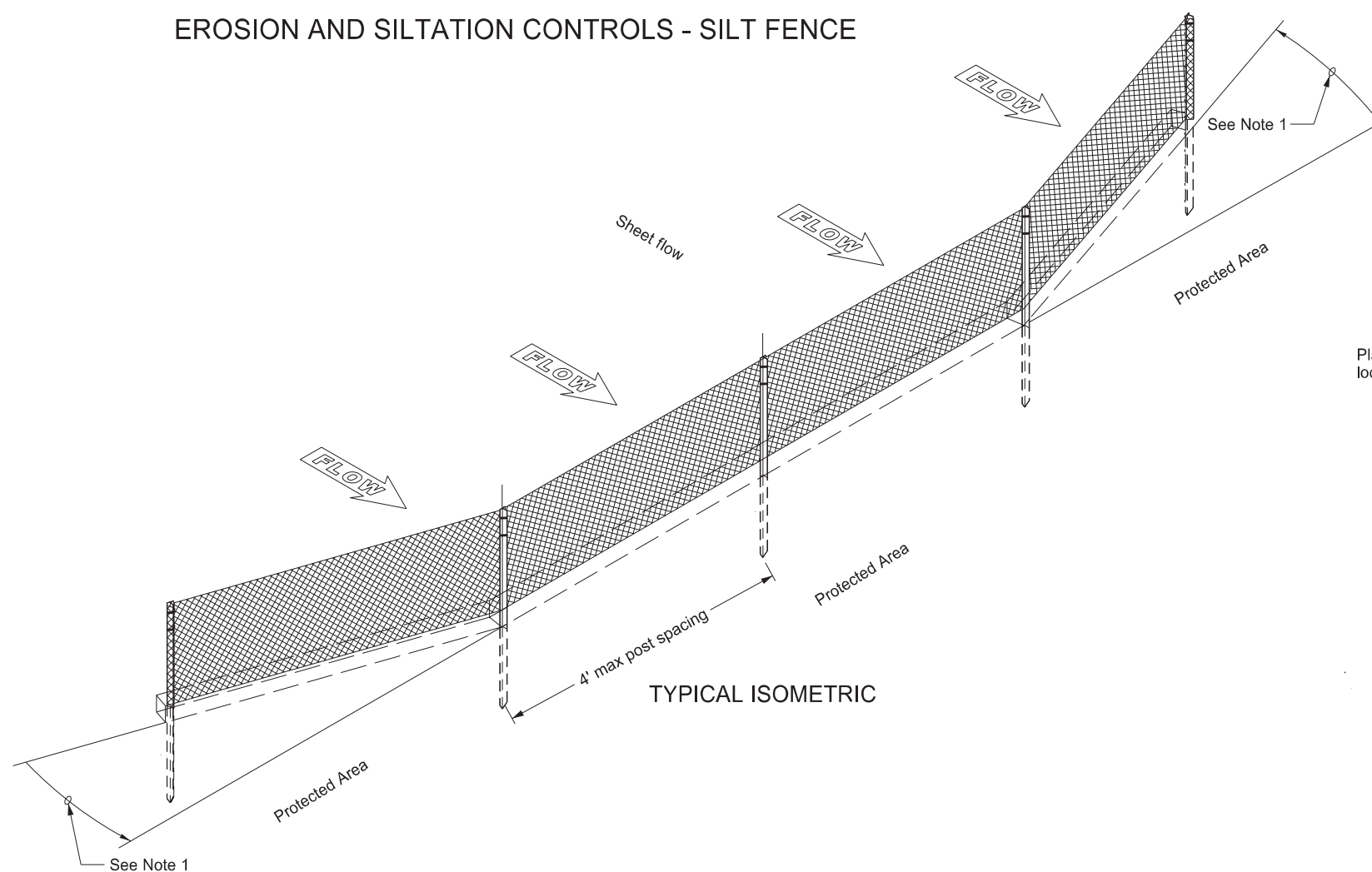
12 18 2020

EROSION AND SILTATION CONTROLS - SILT FENCE

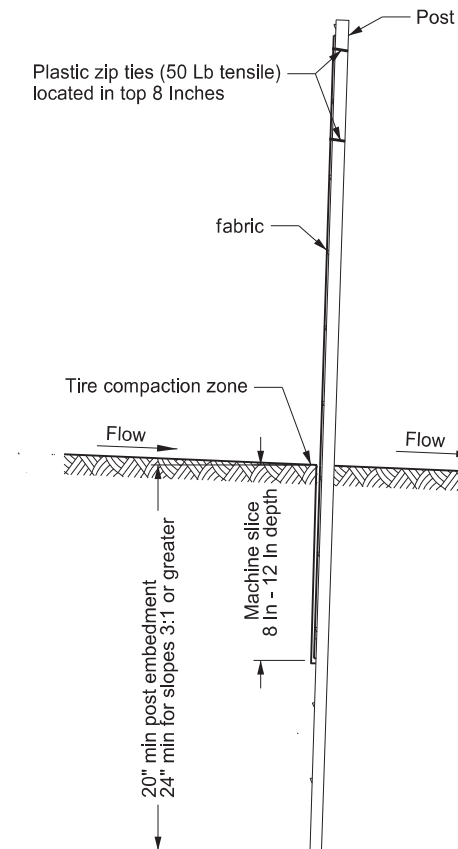


INSTALLATION DETAIL

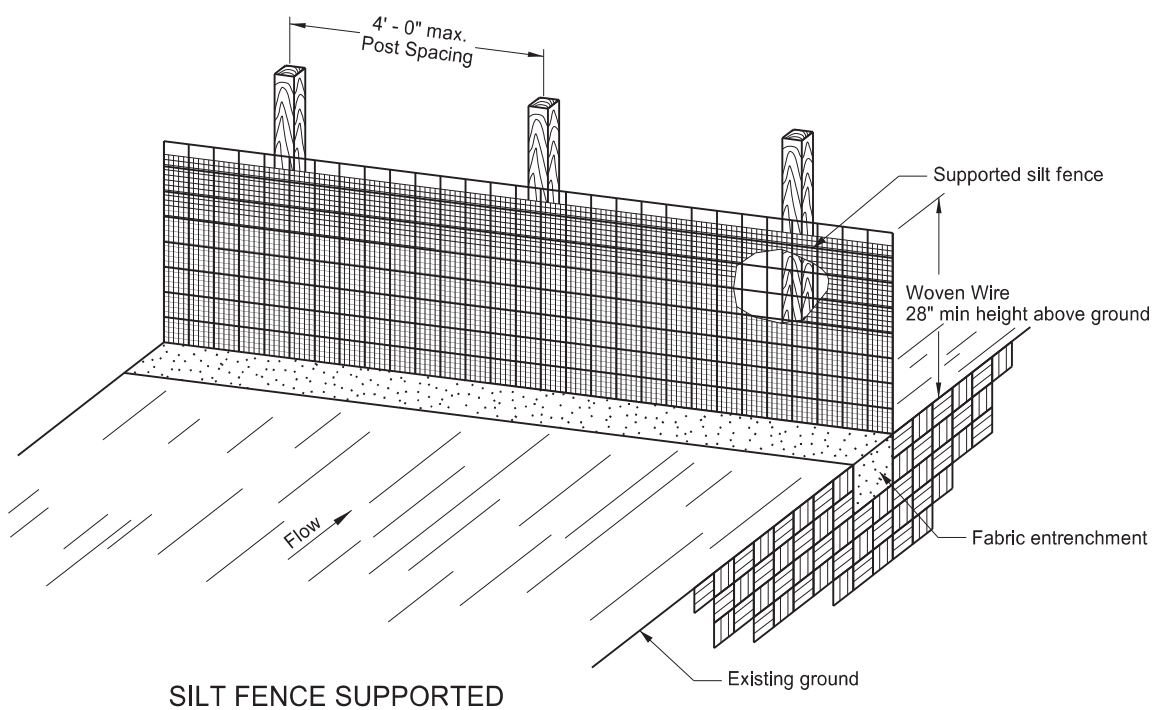
Minimize disturbance of ground around trench and smooth surface after excavation to avoid concentrating flows. Compact to prevent undercutting flows.



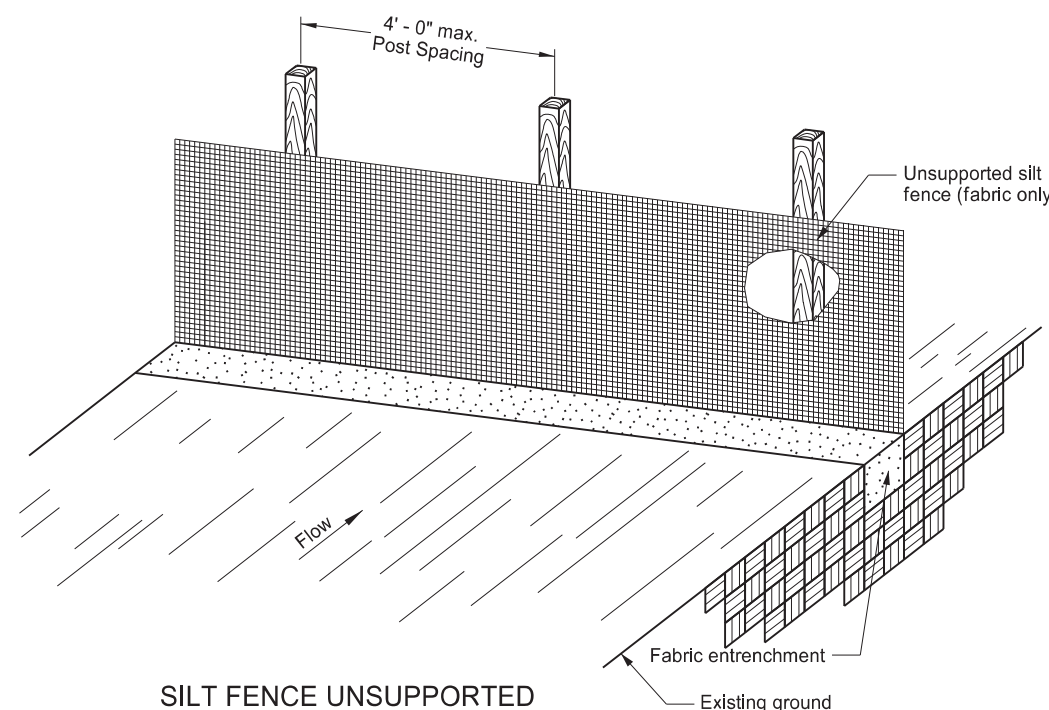
TYPICAL ISOMETRIC



MACHINE SLICED SILT FENCE



SILT FENCE SUPPORTED



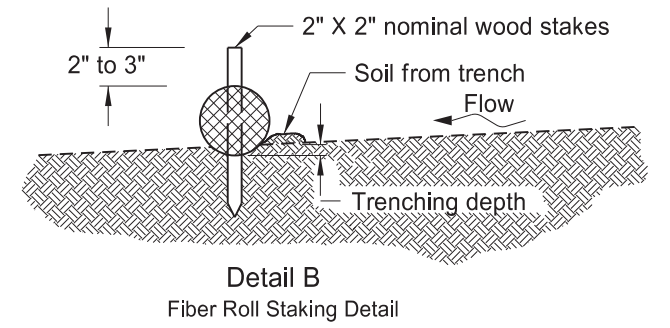
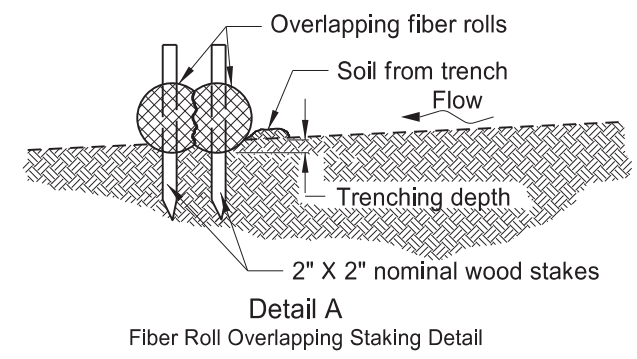
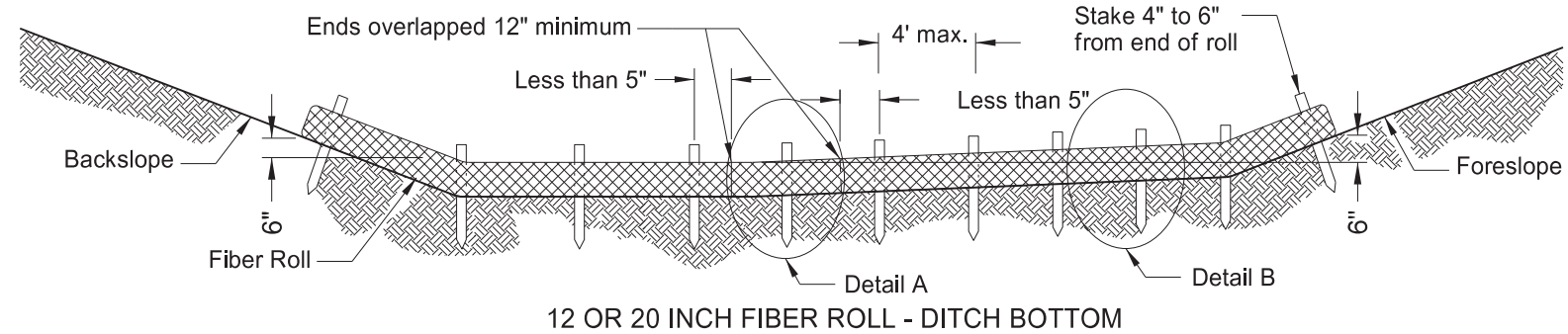
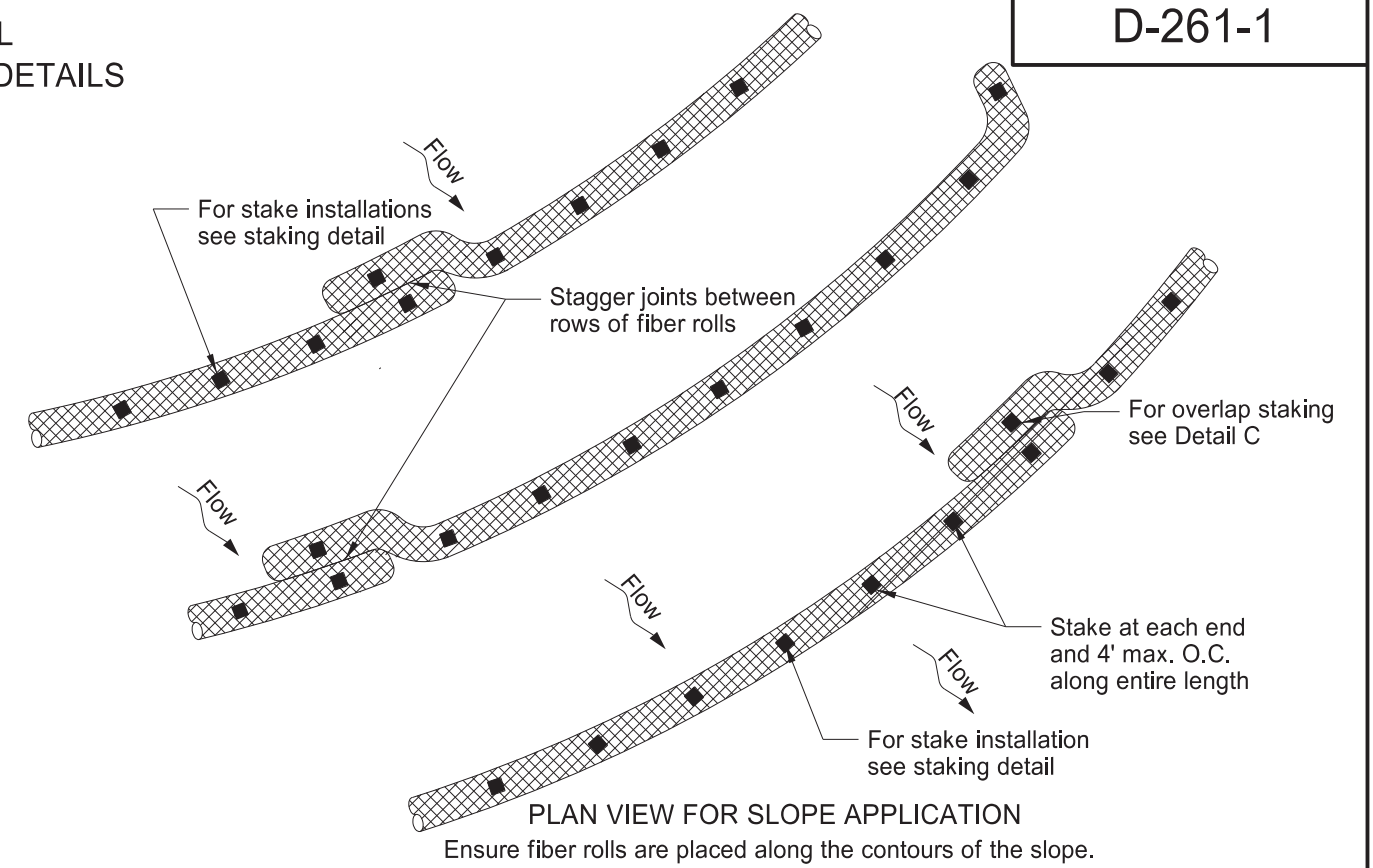
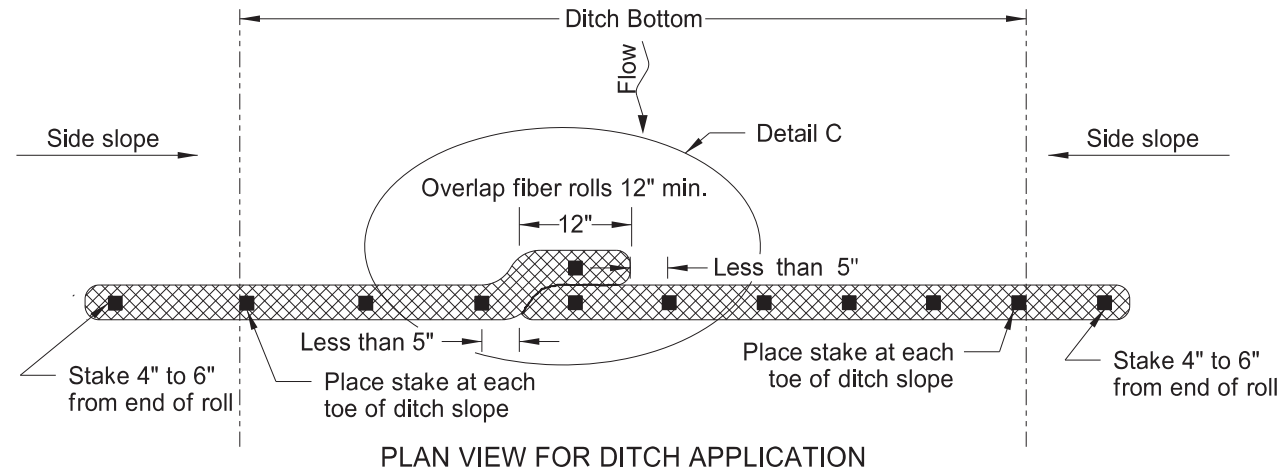
SILT FENCE UNSUPPORTED

- NOTES:
1. Install the ends of the silt fence to point slightly upslope to prevent sediment from flowing around the ends of the fence.
 2. Place splices outside low spots.
 3. Install silt fencing parallel to contour lines.
 4. Do not embed silt fence when placed in standing water.
 5. Silt fence material does not need to reach the top of woven wire support.

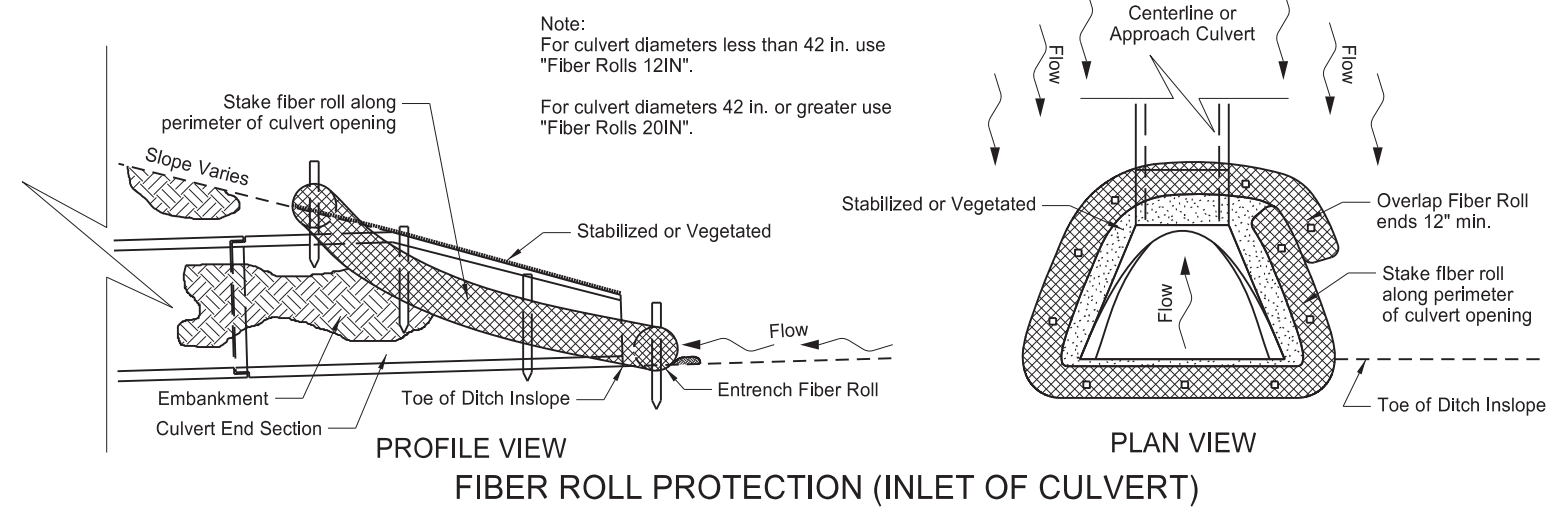
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Standard drawing resulted from splitting standard D-708-2.
06-27-16 08-27-19	Revised details & added new ones. New Design Engineer PE Stamp.

This document was originally issued and sealed by
 Kirk J Hoff,
 Registration Number
 PE- 4683,
 on 08/27/19 and the original document is stored at the
 North Dakota Department
 of Transportation

EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS



NOTE: Do not allow runoff to run under or around roll.



Note:
For culvert diameters less than 42 in. use "Fiber Rolls 12IN".
For culvert diameters 42 in. or greater use "Fiber Rolls 20IN".

FIBER ROLL DIAMETER	NOMINAL STAKE SIZE	MINIMUM STAKE LENGTH	TRENCH DEPTH	
			MINIMUM	MAXIMUM
6"	2" x 2"	18"	2"	2"
9" or 12"	2" x 2"	24"	2"	3"
20"	2" x 2"	36"	3"	5"

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-18-10	
REVISIONS	
DATE	CHANGE
06-10-13	Added plan view for ditch and slope application. Added table with values for stake and trench dimensions.
06-26-14	Revised fiber roll overlap detail. Changed standard drawing number from D-708-7 to D-261-1.
08-27-19	New Design Engineer PE Stamp.
04-22-24	Slope Plan View-overlap change.
03-13-25	Added D-708-6 Culvert Inlet detail.

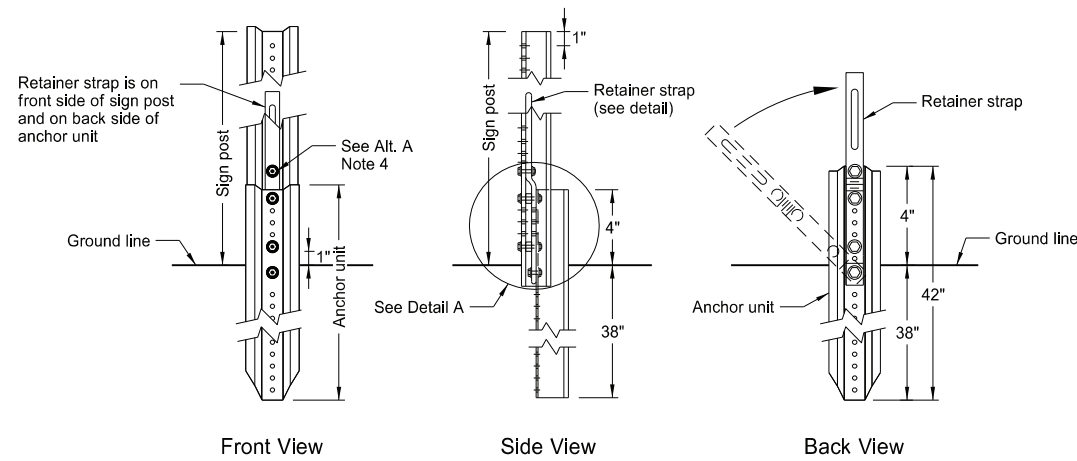
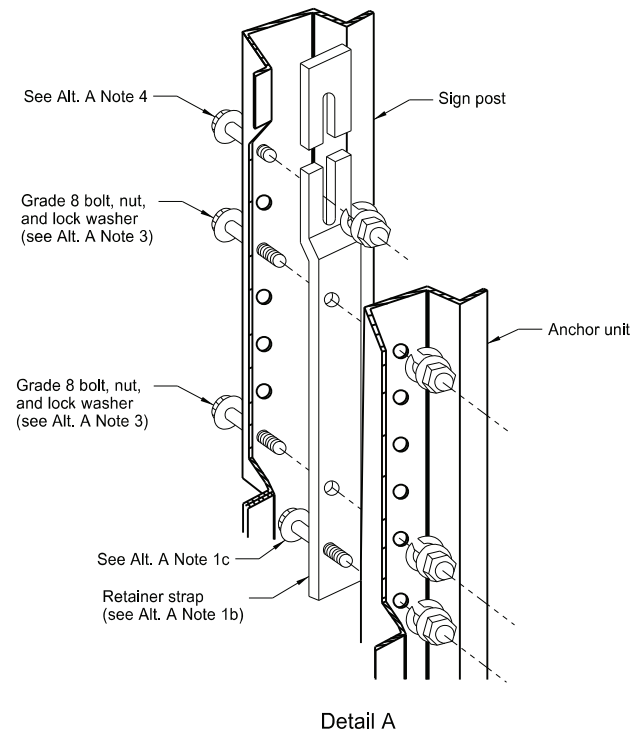


03/13/25

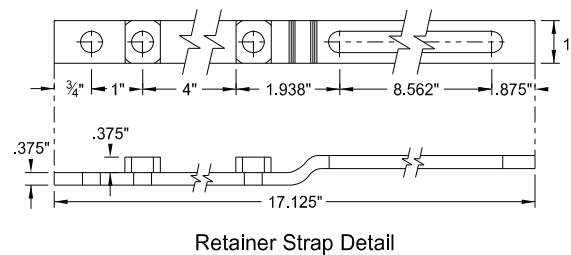
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

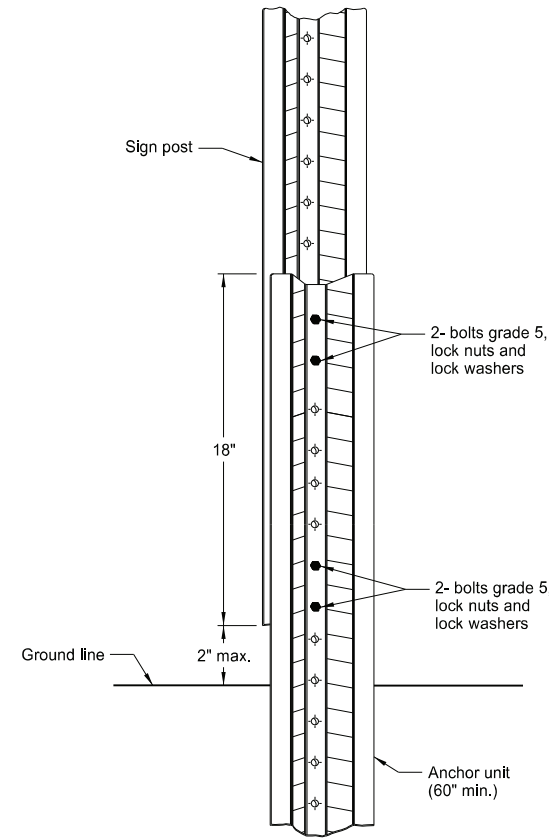
U-Channel Post



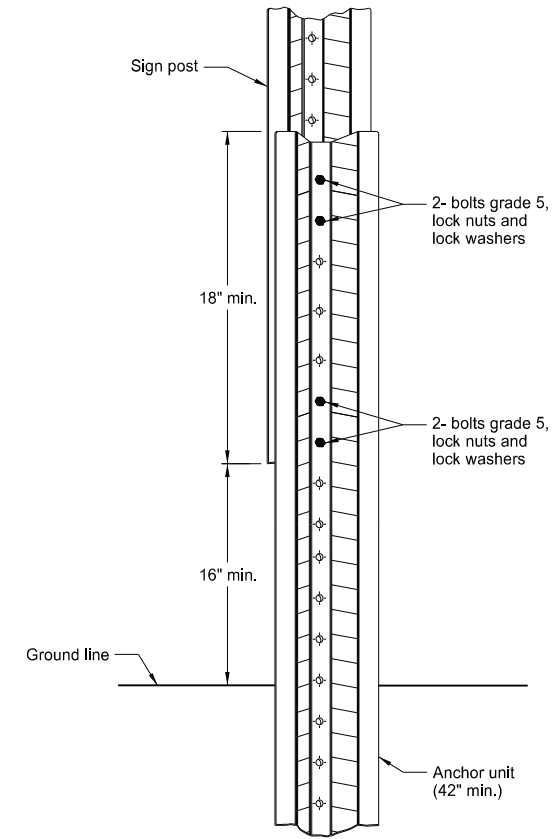
Breakaway U-Channel Detail Alternate A
Install a maximum of 2 posts within 7'.



Retainer Strap Detail



Breakaway U-Channel Splice Detail Alternate B
(2.5 and 3 lb/ft)
Install a maximum of 3 posts within 7'.



Breakaway U-Channel Splice Detail Alternate C
(2.5 and 3 lb/ft)
Install a maximum of 3 posts within 7'.

Alternate A Steps of Installation:

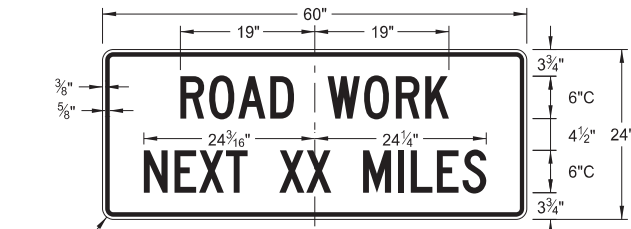
1. a) Drive anchor unit to within 12" of ground level.
b) Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
d) Rotate strap 90° to left.
2. a) Drive anchor unit to 4" above ground.
b) Rotate strap to vertical position.
3. a) Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
b) Alternately tighten two connector bolts.
4. Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
5. Properly nest base post, strap, and sign post. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

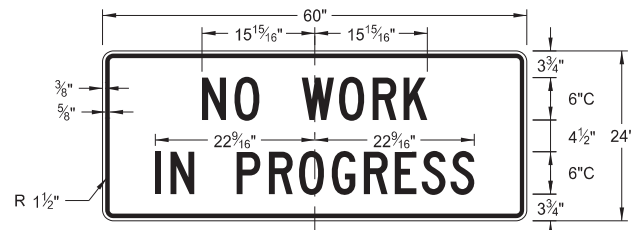


08/01/24

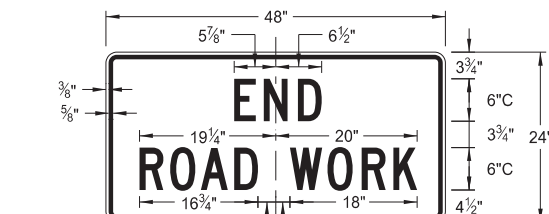
CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS



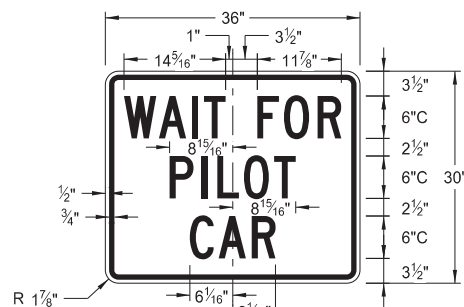
G20-1-60
Legend: black (non-refl)
Background: orange



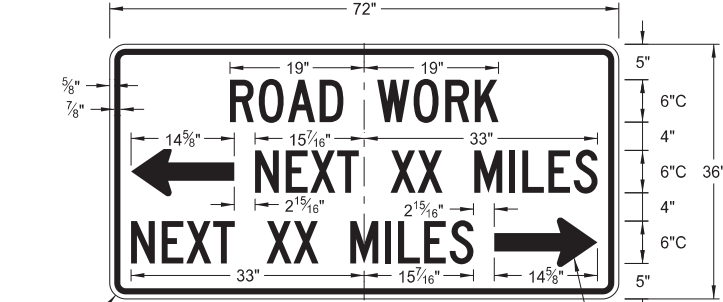
G20-1b-60
Legend: black (non-refl)
Background: orange



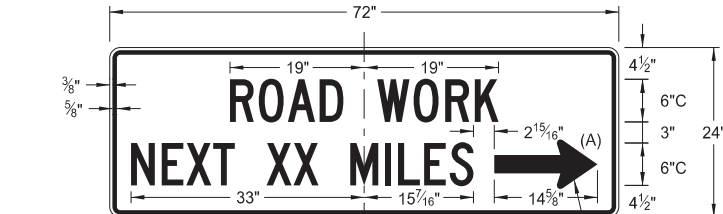
G20-2-48
Legend: black (non-refl)
Background: orange



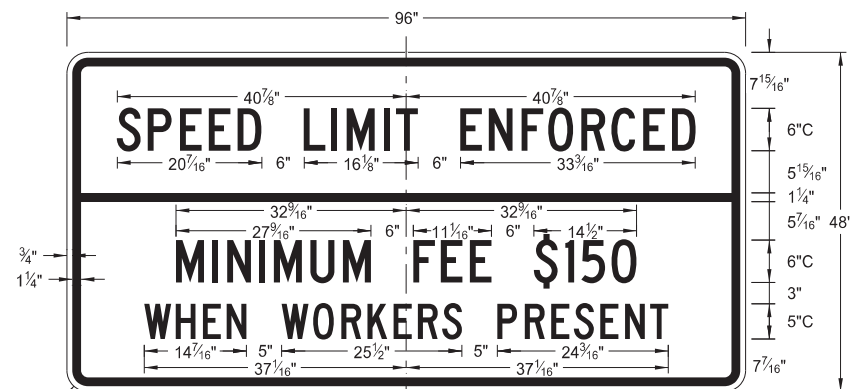
G20-4b-36
Legend: black (non-refl)
Background: orange



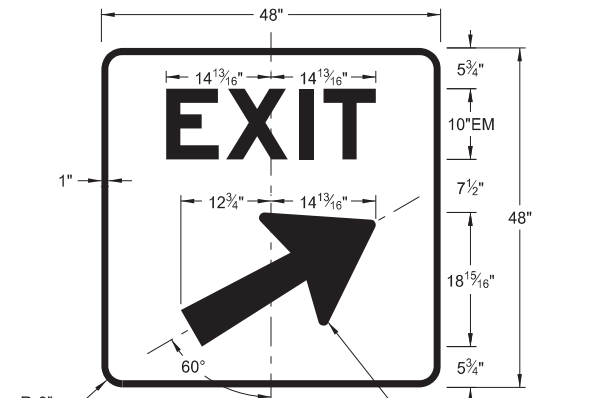
G20-50a-72
Legend: black (non-refl)
Background: orange



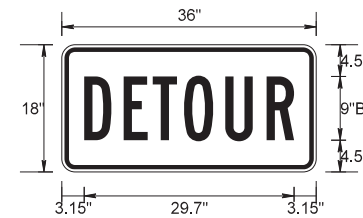
G20-52a-72
Legend: black (non-refl)
Background: orange



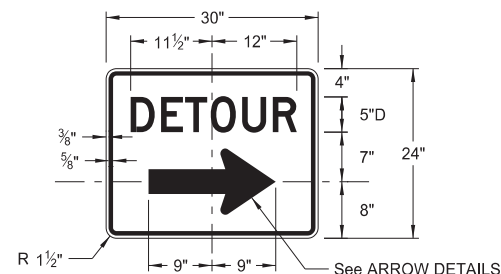
G20-55-96
Legend: black (non-refl)
Background: orange



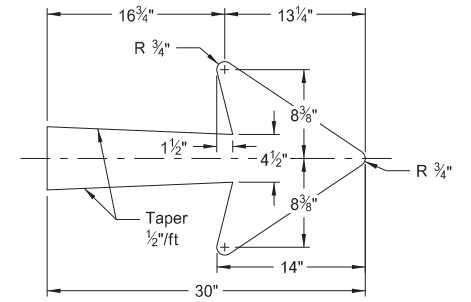
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



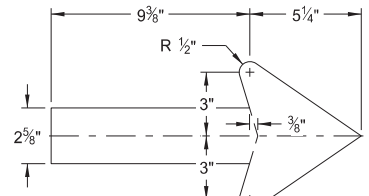
M4-8-36
Legend: black (non-refl)
Background: orange



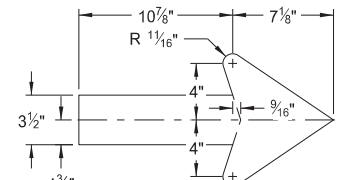
M4-9(L or R)-30 & M4-9-30
Legend: black (non-refl)
Background: orange



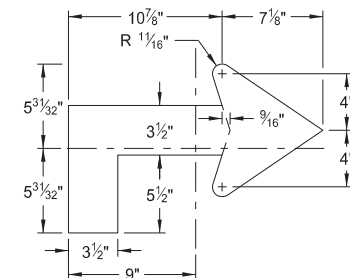
E5-1-48



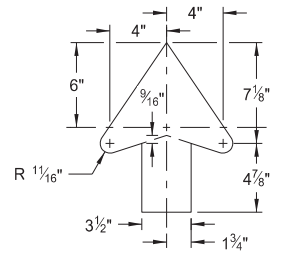
G20-50a-72
G20-52a-72



M4-9(L or R)-30
Right or Left



M4-9(L or R)-30
Advanced Right or Left



M4-9-30
Straight

ARROW DETAILS

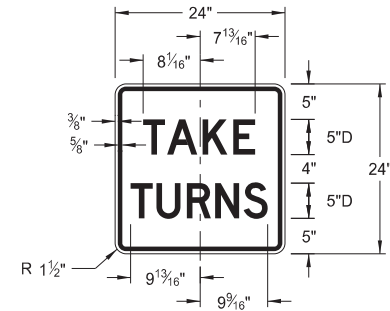
NOTES:

(A) Arrow may be right or left of the legend to indicate construction to the right or left.

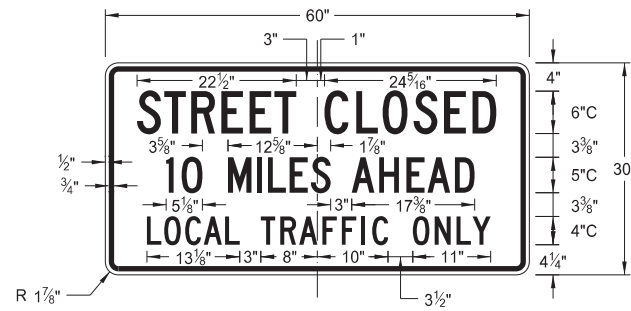
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Added sign & background color
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



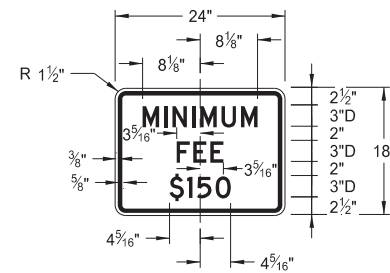
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



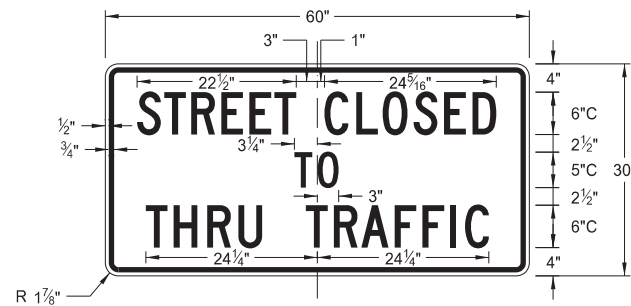
R1-50P-24
Legend: black (non-refl)
Background: white



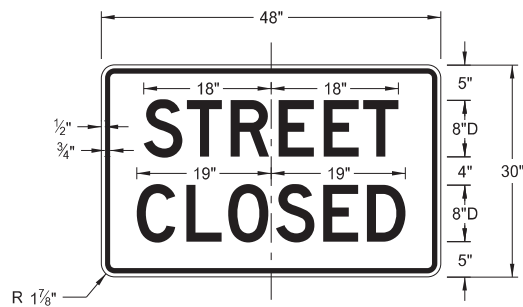
R11-3c-60
Legend: black (non-refl)
Background: white



R2-1aP-24
Legend: black (non-refl)
Background: white



R11-4a-60
Legend: black (non-refl)
Background: white

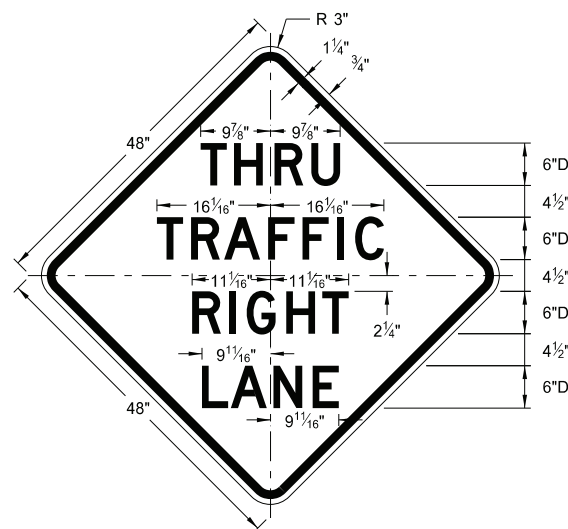


R11-2a-48
Legend: black (non-refl)
Background: white

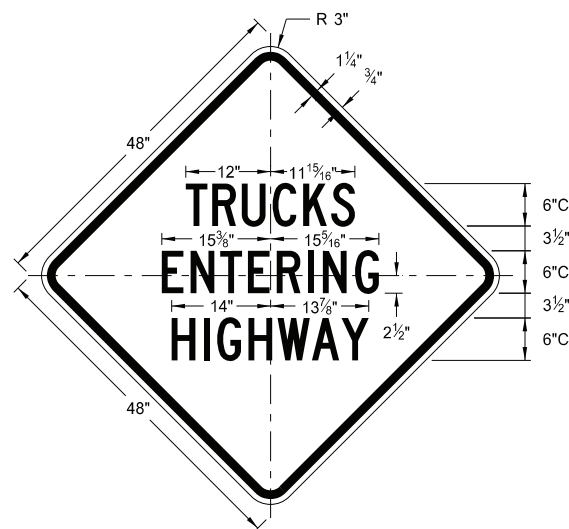
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



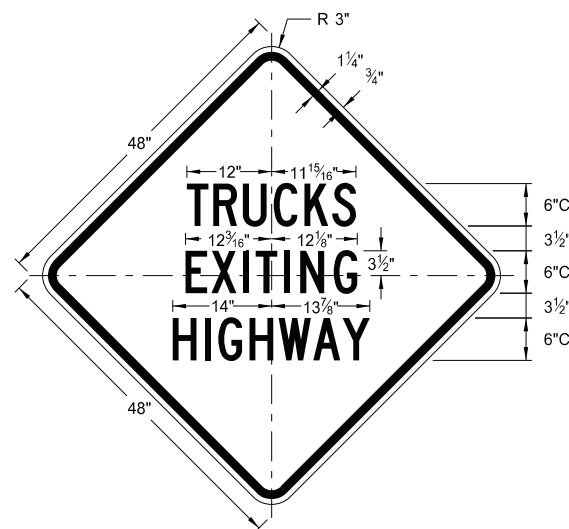
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



W5-8-48
Legend: black (non-refl)
Background: orange



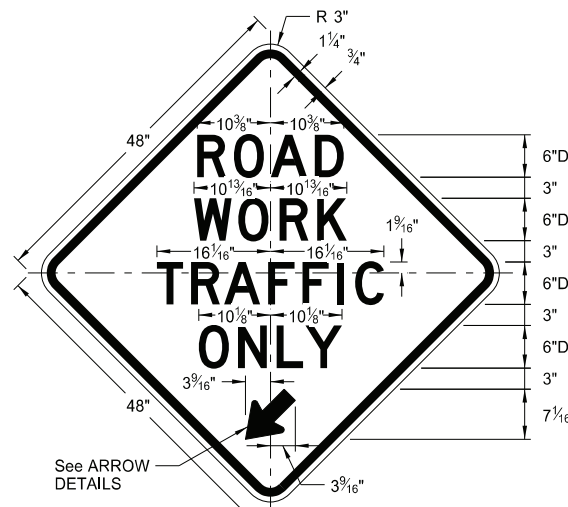
W8-53-48
Legend: black (non-refl)
Background: orange



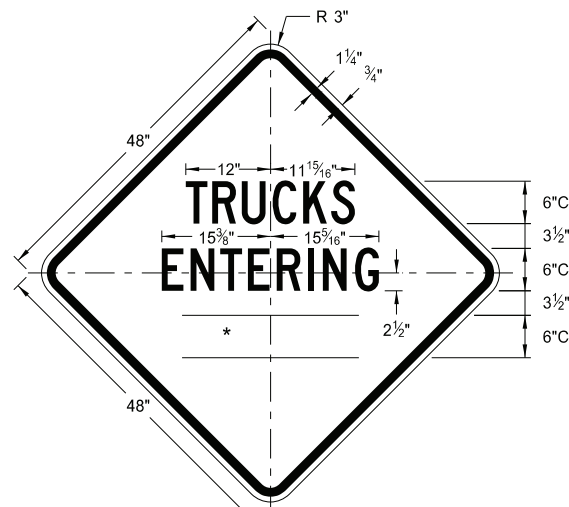
W8-56-48
Legend: black (non-refl)
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

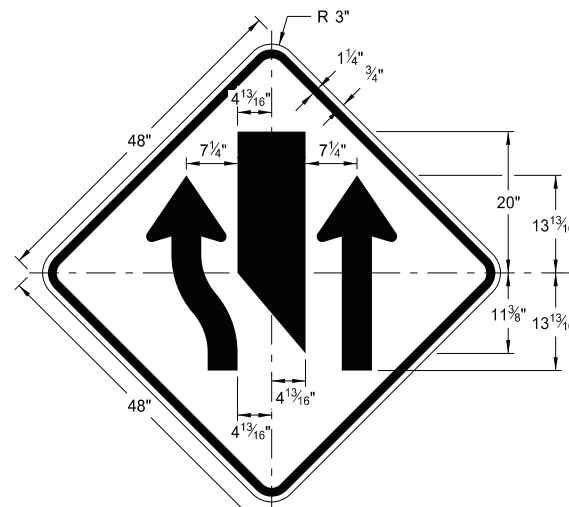
* DISTANCE MESSAGES



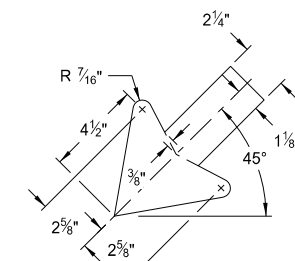
W5-9-48
Legend: black (non-refl)
Background: orange



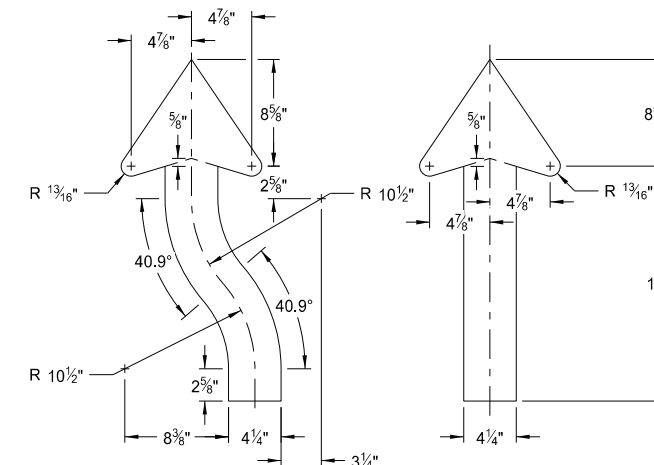
W8-54-48
Legend: black (non-refl)
Background: orange



W9-3a-48
Legend: black (non-refl)
Background: orange

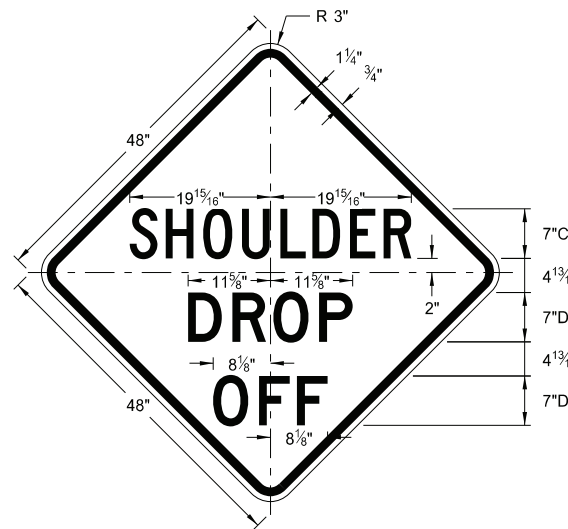


W5-9-48

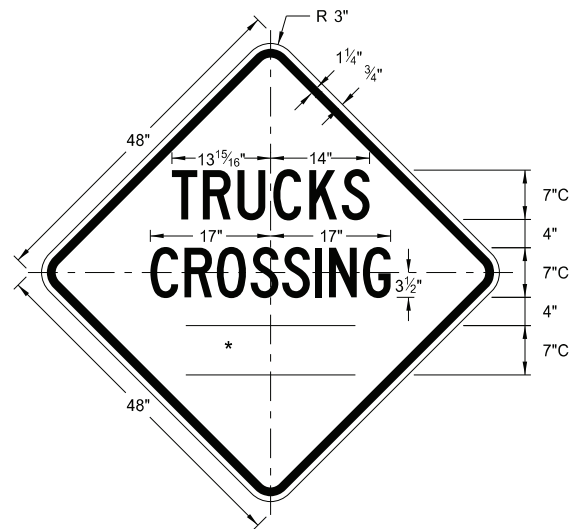


W9-3a-48

ARROW DETAILS



W8-9a-48
Legend: black (non-refl)
Background: orange



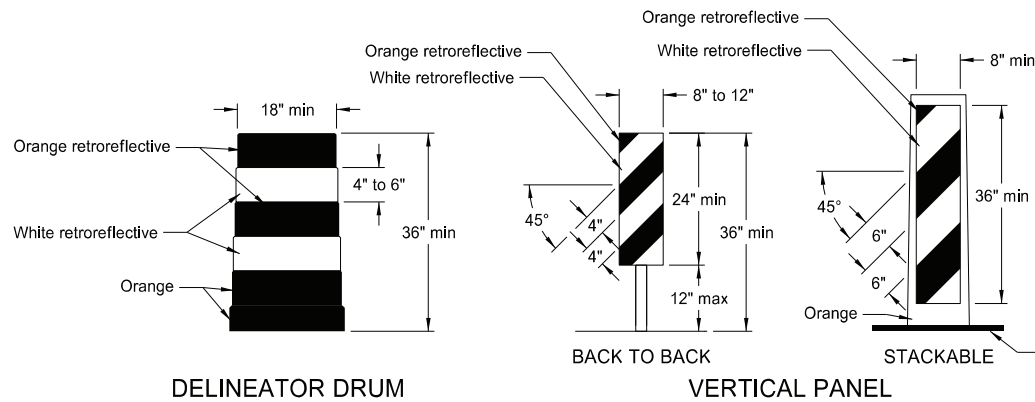
W8-55-48
Legend: black (non-refl)
Background: orange

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp
8-01-24	Electronic Stamp/Signature



08/01/24

BARRICADE AND CHANNELIZING DEVICE DETAILS

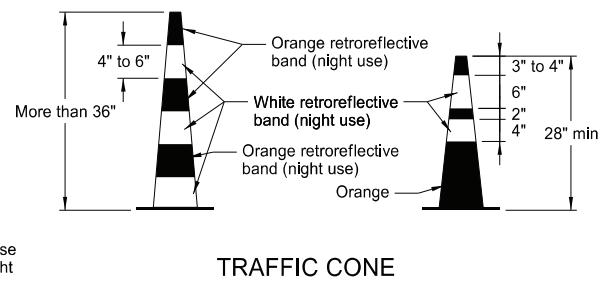


DELINEATOR DRUM

VERTICAL PANEL

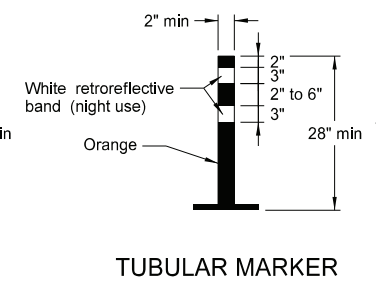
Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflective spaces between the horizontal orange and white stripes. Avoid placement of stripes on drum ribs or indentations. Use closed top drums that will not allow collection of debris. Do not place ballast on the top of drum.

Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, use a stripe width of 6 inches.



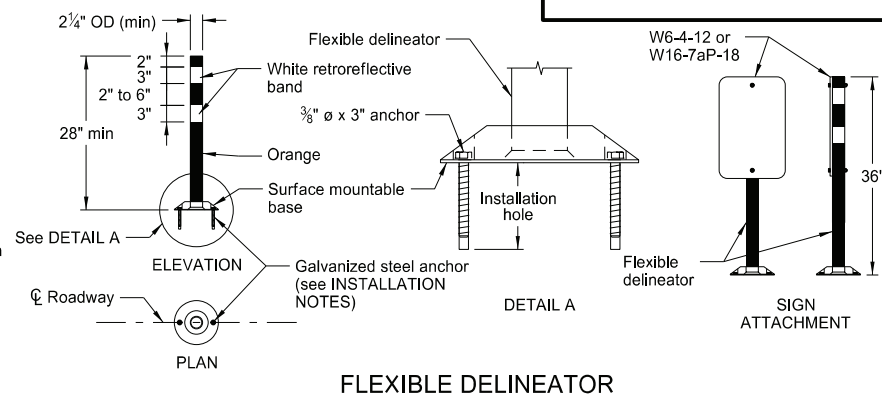
TRAFFIC CONE

Provide retroreflective cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflective space between the orange and white stripes.



TUBULAR MARKER

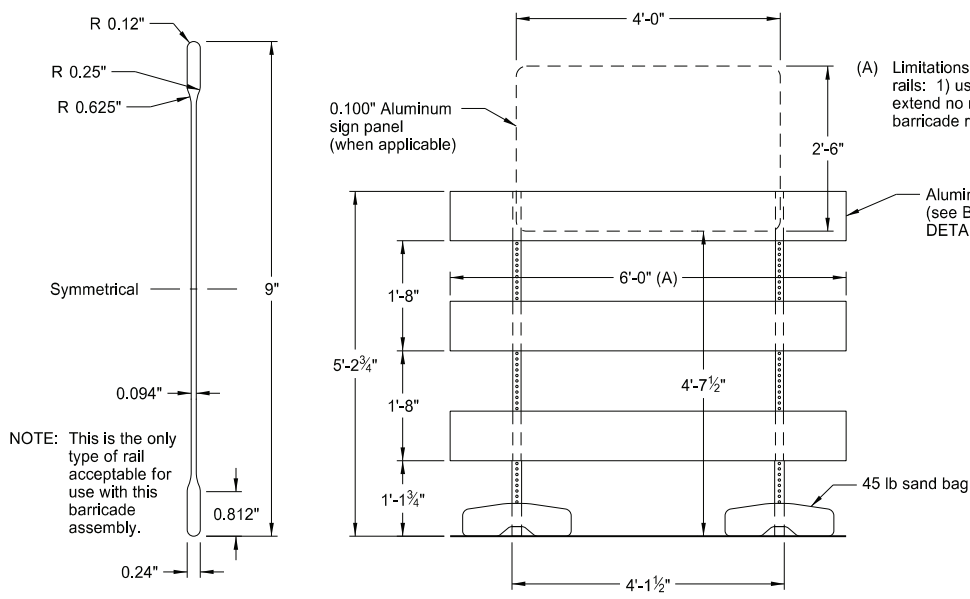
Provide retroreflective tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



FLEXIBLE DELINEATOR

INSTALLATION NOTES:

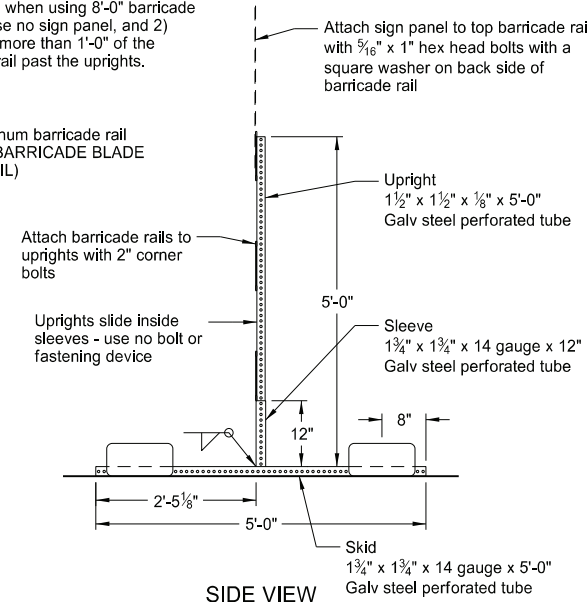
1. Drill installation holes to diameter and depth required by manufacturer's specifications.
2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
3. In lieu of bolted down base, use an 8" x 8" butyl pad or hot melt butyl. Remove butyl as close as possible to pavement surface.



BARRICADE BLADE DETAIL

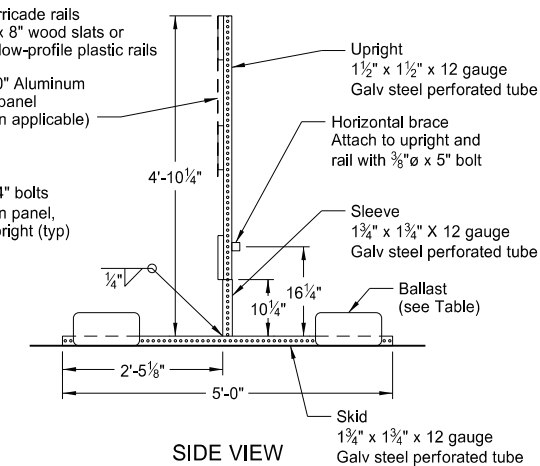
ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)



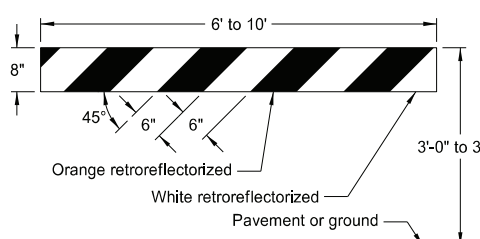
ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

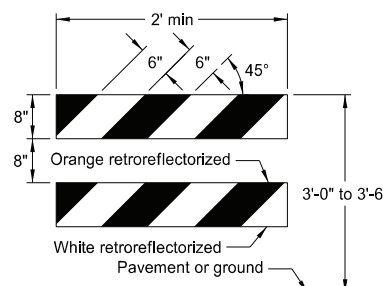


SIDE VIEW

NOTE: This is the only type of rail acceptable for use with this barricade assembly.

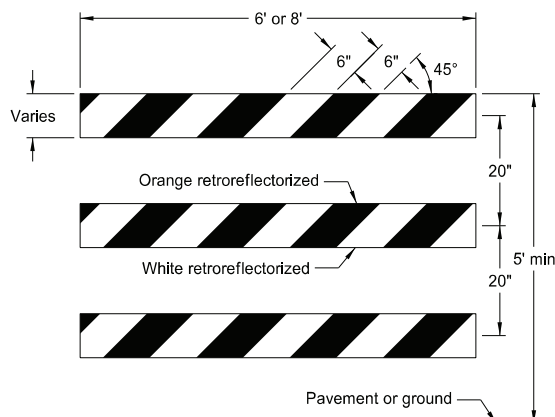


TYPE I BARRICADE

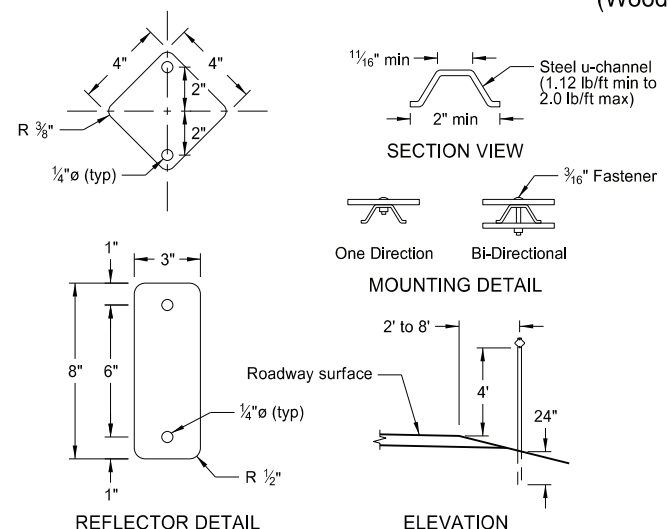


TYPE II BARRICADE

BARRICADE RAIL DETAILS



TYPE III BARRICADE



REFLECTOR DETAIL

ELEVATION

DELINEATORS

MINIMUM BALLAST (For each side of barricade support)

Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

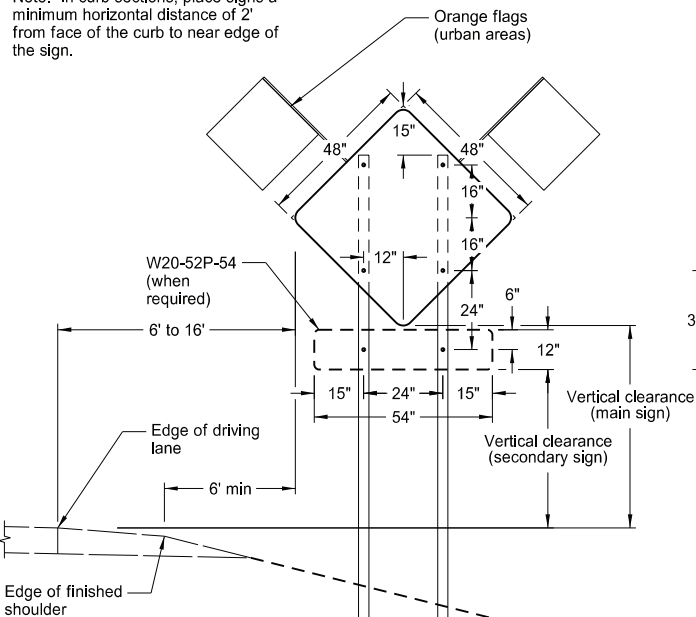
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
11-01-19	Revised details for Flexible Delineator
8-01-24	Electronic Stamp/Signature



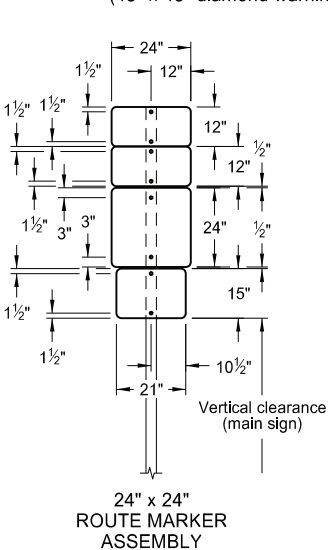
08/01/24

CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

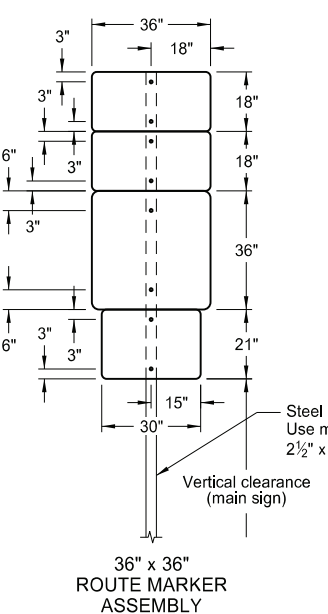
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



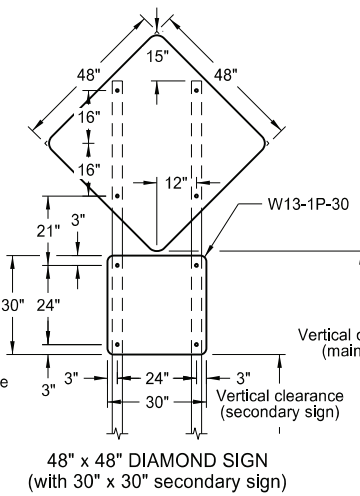
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



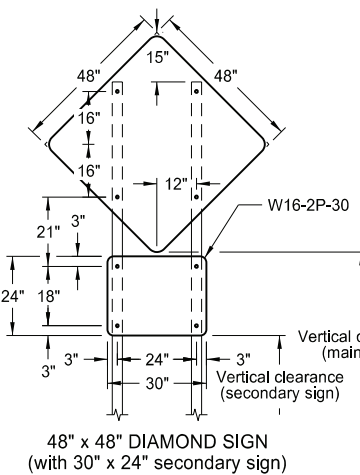
24" x 24" ROUTE MARKER ASSEMBLY



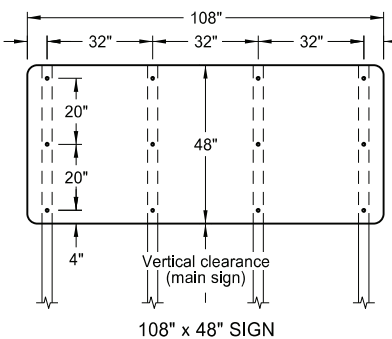
36" x 36" ROUTE MARKER ASSEMBLY



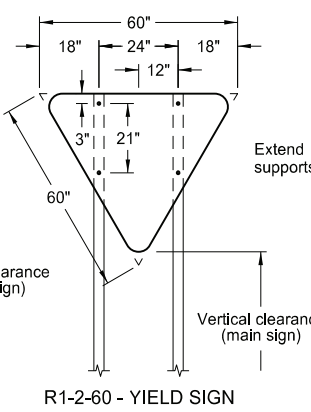
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



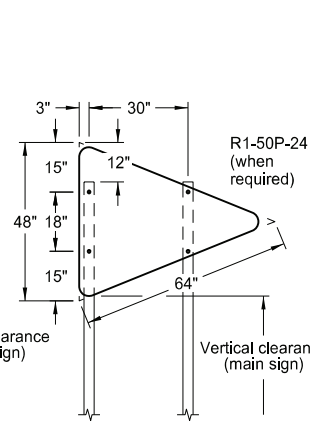
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



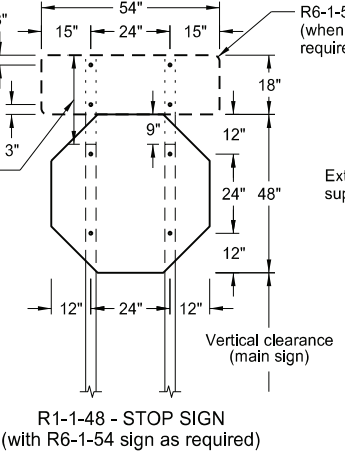
18" x 18" DIAMOND SIGN



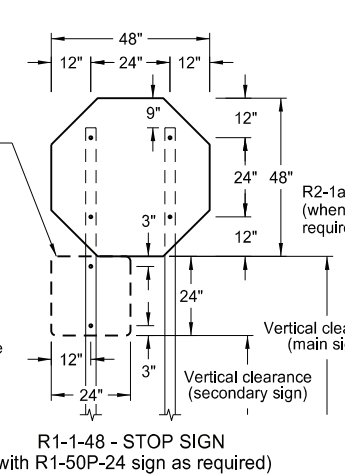
R1-2-60 - YIELD SIGN



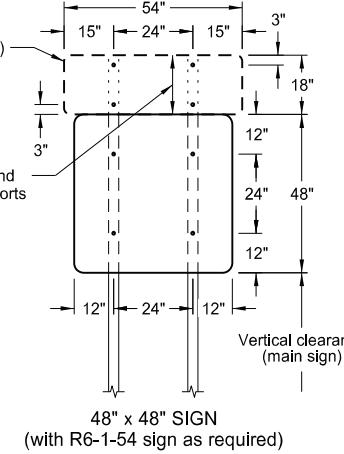
W13-3-64 - PENNANT SIGN



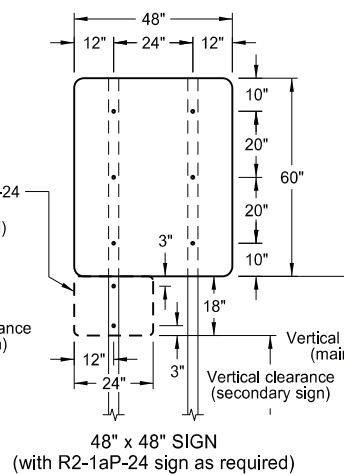
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



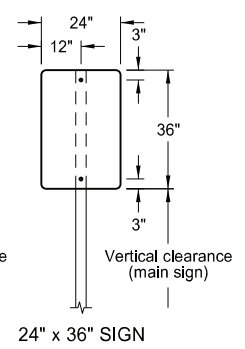
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



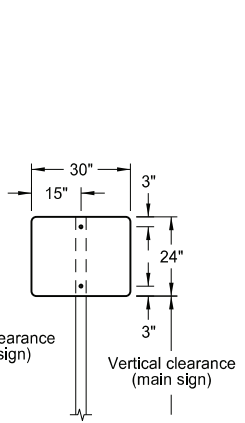
48" x 48" SIGN
(with R6-1-54 sign as required)



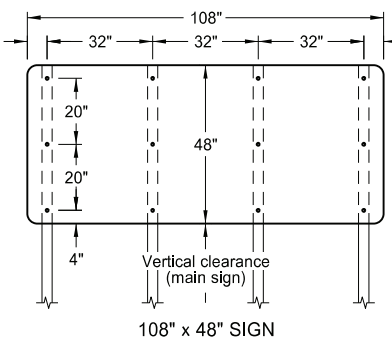
48" x 48" SIGN
(with R2-1aP-24 sign as required)



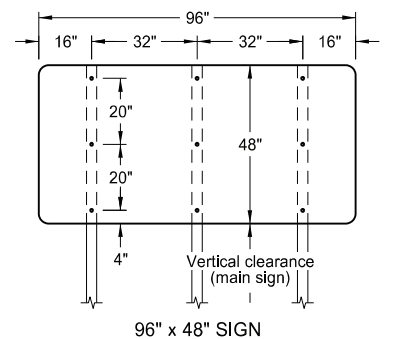
24" x 36" SIGN



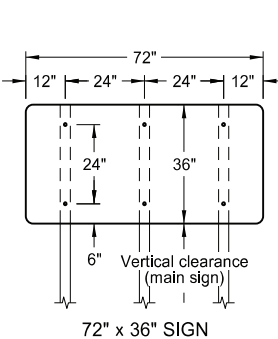
30" x 24" SIGN



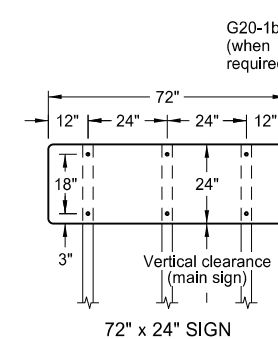
108" x 48" SIGN



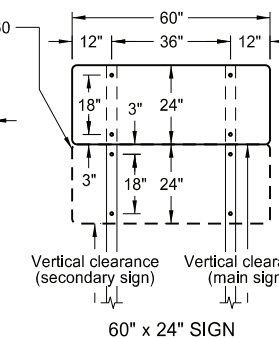
96" x 48" SIGN



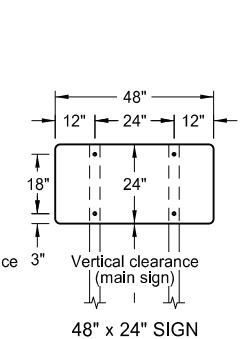
72" x 36" SIGN



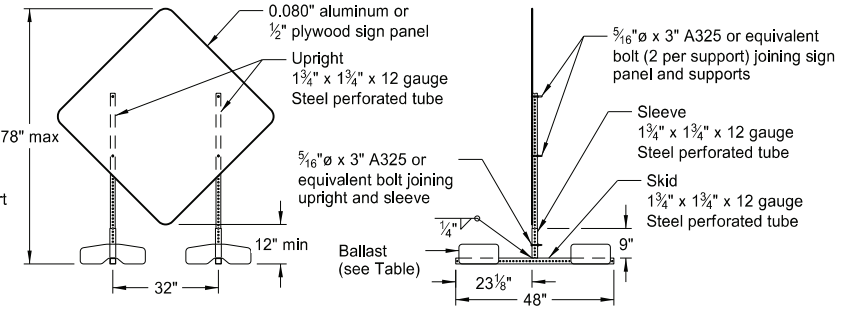
72" x 24" SIGN



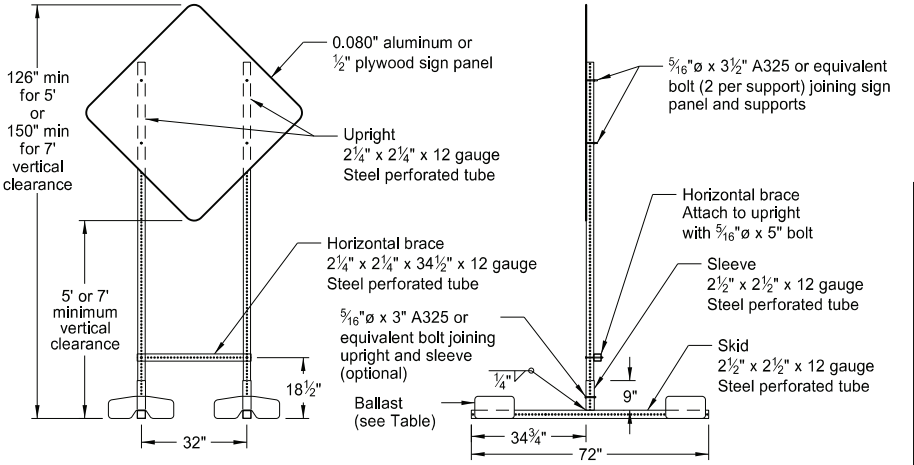
60" x 24" SIGN



48" x 24" SIGN



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

- Sign Supports: Galvanize or paint supports. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH.

Place signs over 50 square feet on 2 1/2" x 2 1/2" perforated tube supports as a minimum.

Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.
- Sign Panels: Provide sign panels made of 0.100" aluminum, 1/2" plywood, or other approved material, except where noted. Punch all holes round for 3/8" bolts.
- Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on lane closure sign)
- Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

Interstate - white legend on blue background
Interstate Business Loop - white legend on green background
US and State - black legend on white background
County - yellow legend on blue background
- Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.

The vertical clearance to secondary signs is 1'-0" less than the vertical clearance stated above.

Provide a minimum clearance of 7'-0" from the ground at the post for signs with an area exceeding 50 square feet.
- Portable Signs: Provide portable signs that meet the vertical clearance stated above when it is necessary to place signs within the pavement surface.

Use of low-mounting height (minimum 12" vertical clearance) portable signs for 5 days or less, is allowed as long as the view of the sign is not obstructed. Time delays caused by unforeseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. Use of R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 is allowed for longer than 5 days.

Restrict signs mounted on portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT details to a maximum surface area of 16 square feet.

MINIMUM BALLAST
(For each side of sign support base)

Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

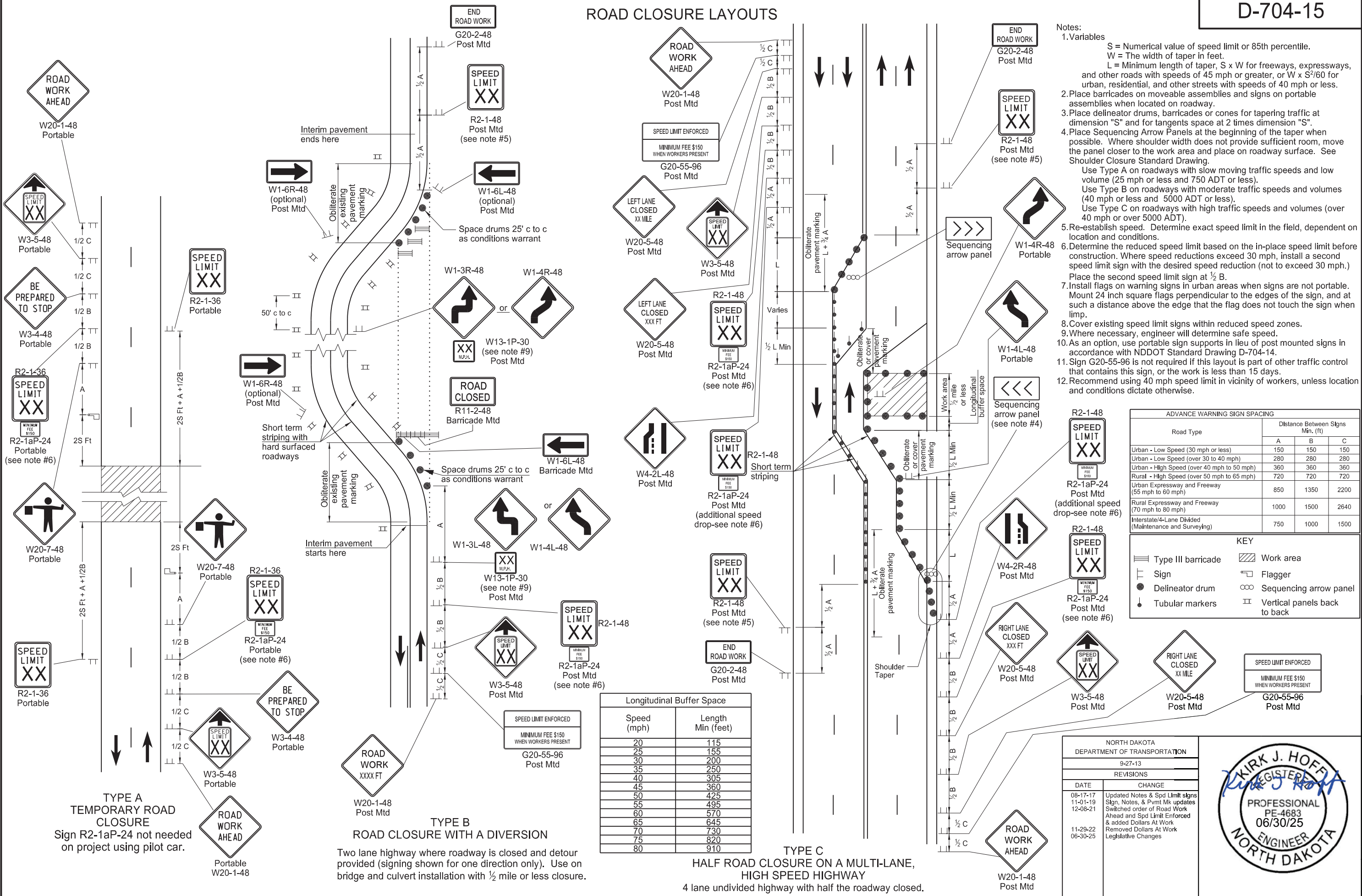
Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of sklds.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
REVISIONS	
DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail
8-01-24	Electronic Stamp/Signature



08/01/24

ROAD CLOSURE LAYOUTS



- Notes:
- Variables
 - S = Numerical value of speed limit or 85th percentile.
 - W = The width of taper in feet.
 - L = Minimum length of taper, S x W for freeways, expressways, and other roads with speeds of 45 mph or greater, or W x S²/60 for urban, residential, and other streets with speeds of 40 mph or less.
 - Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
 - Place delineator drums, barricades or cones for tapering traffic at dimension "S" and for tangents space at 2 times dimension "S".
 - Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on roadway surface. See Shoulder Closure Standard Drawing.
 - Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
 - Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
 - Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
 - Re-establish speed. Determine exact speed limit in the field, dependent on location and conditions.
 - Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
 - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
 - Cover existing speed limit signs within reduced speed zones.
 - Where necessary, engineer will determine safe speed.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
 - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

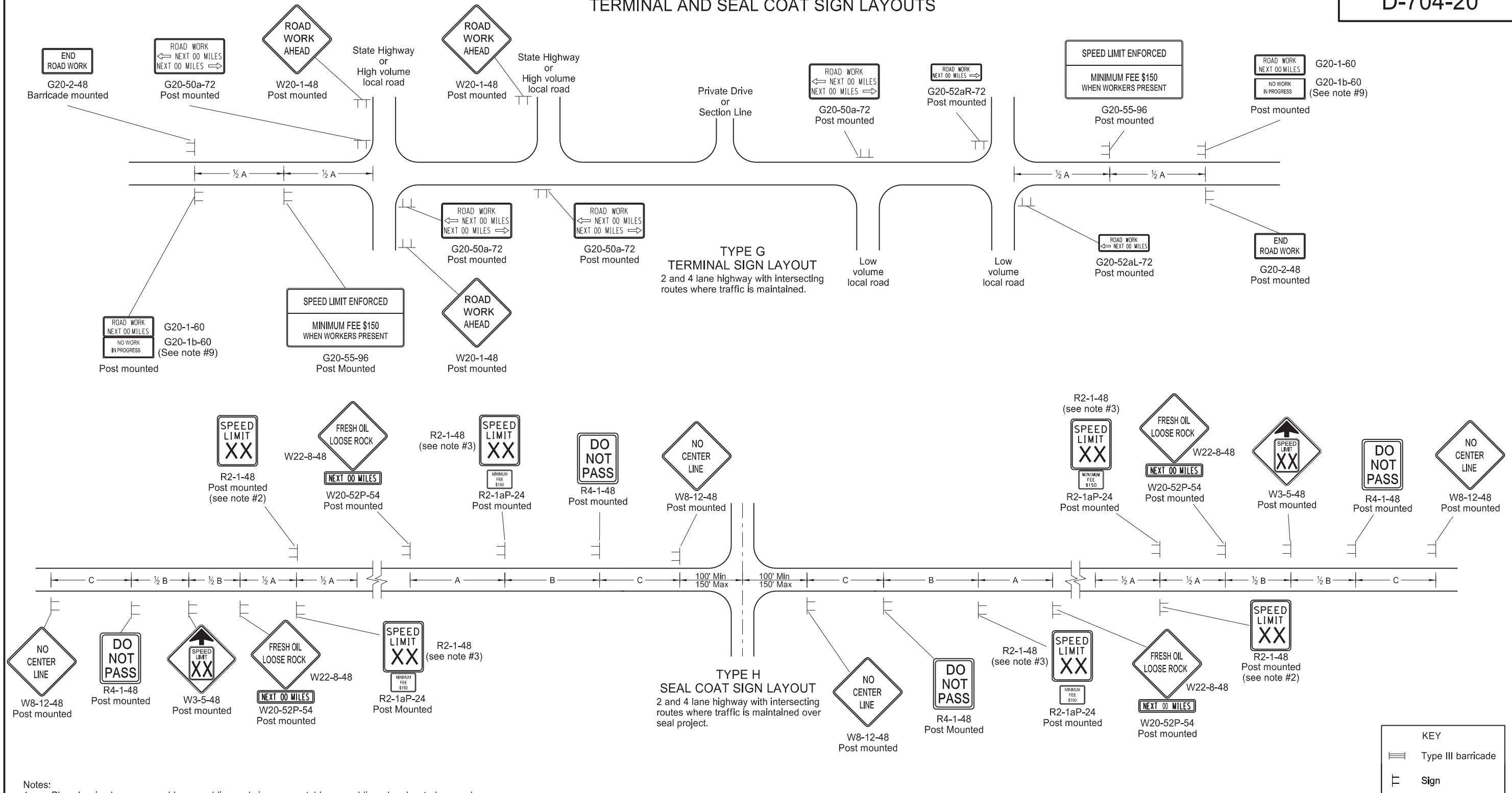
	Type III barricade		Work area
	Sign		Flagger
	Delineator drum		Sequencing arrow panel
	Tubular markers		Vertical panels back to back

Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pmnt Mk updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes



TERMINAL AND SEAL COAT SIGN LAYOUTS



- Notes:
- Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
 - Determine the exact speed limit in the field, based on location and conditions.
 - Determine the reduced speed limit based on the in place speed limit before construction. Where speed limit reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 MPH.) Place the second speed limit sign at 1/2 B.
 - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
 - Cover existing speed limit signs within a reduced speed zone.
 - On seal coat projects, place signs R2-1-48, R2-1aP-24, R4-1-48, W22-8-48 and W20-52P-54 after all important intersections and at five mile intervals. Place sign W8-12-48 after all important intersections and at 2 mile intervals until short term center line pavement marking is placed.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Drawing D-704-14.
 - Cover or remove speed limit signs from layout Type H when loose aggregate is removed.
 - Install sign G20-1b-60 when work is suspended for winter.
 - Use other traffic control layouts in immediate work areas. Place sign R2-1aP-24 below speed limit signs in reduced speed limit work areas.
 - Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
 - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated notes & sign numbers
11-01-19	Updated note & sign
12-08-21	Switched order of Road Work and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

KEY

≡ Type III barricade

⊥ Sign

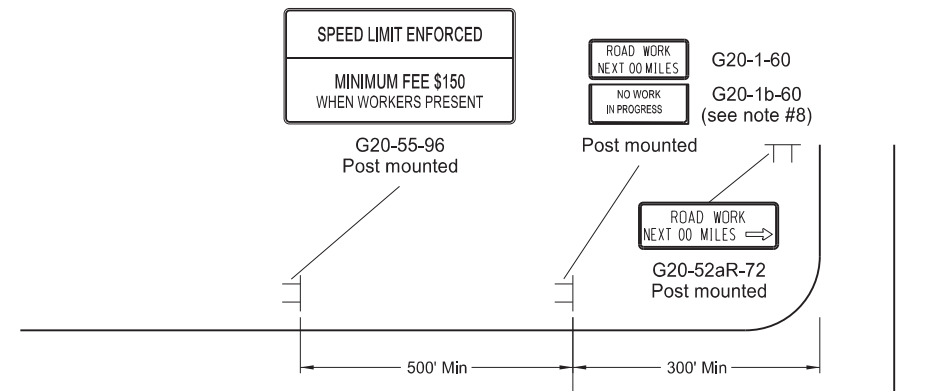
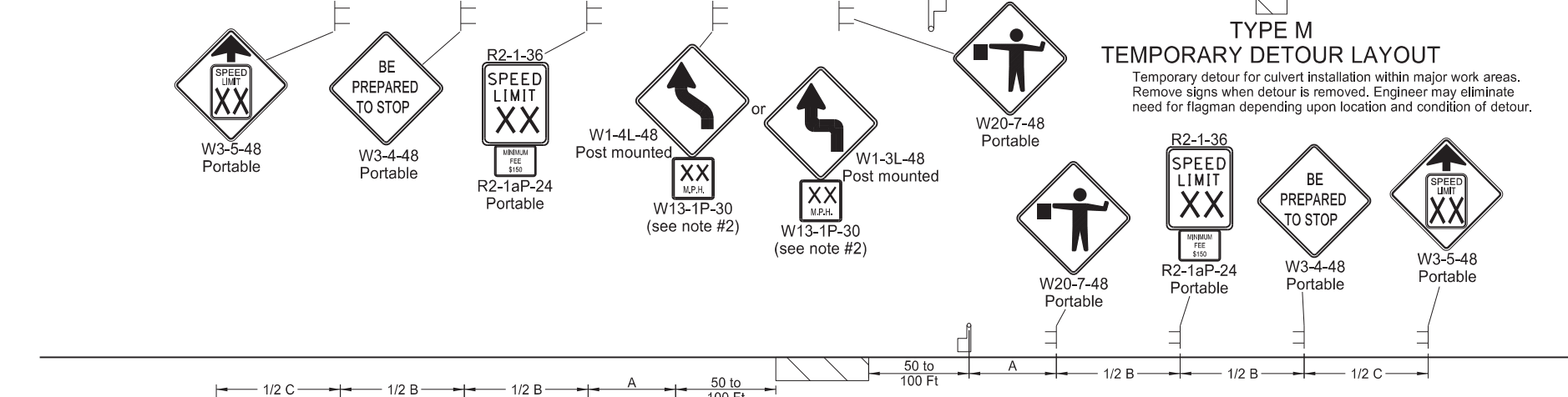
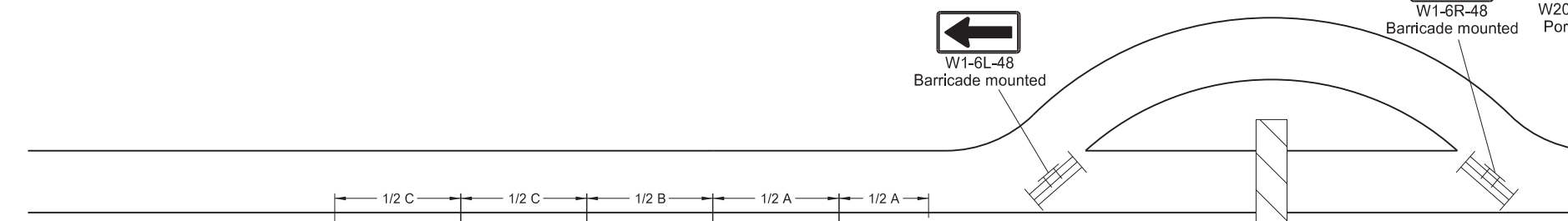
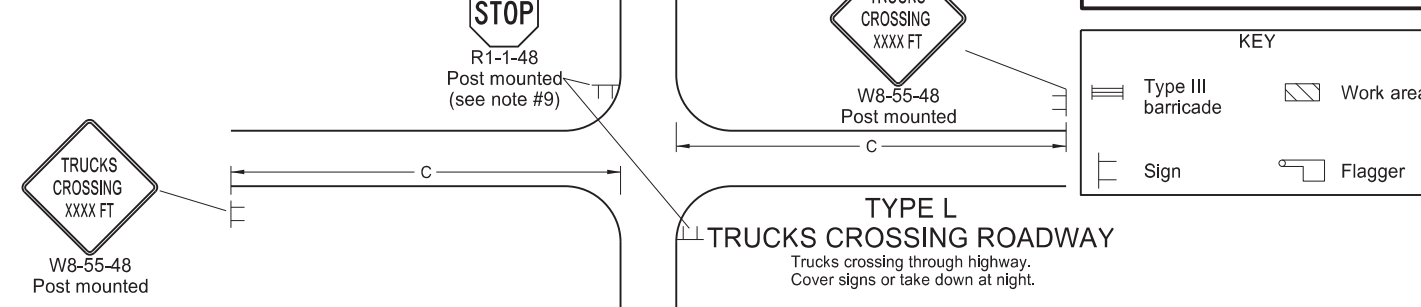
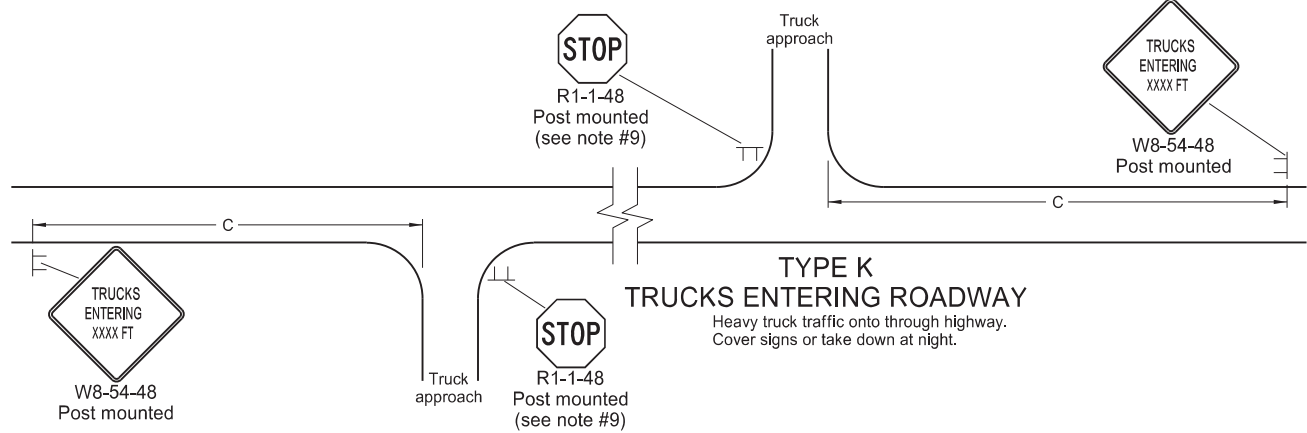


D-704-22

CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

KEY

- Type III barricade
- Sign
- Work area
- Flagger



- Notes:
- Place barricades on a moveable assemblies and signs on portable assemblies when located on roadway.
 - Where necessary, safe speed to be determined by the Engineer.
 - Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
 - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
 - Cover existing speed limit signs within a reduced speed zone.
 - Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - Install sign G20-1b-60 when work is suspended for winter.
 - If existing stop sign is in place, a 48" stop sign is not required.
 - Sign G20-55-96 is not required if layout is part of other traffic control that contains this sign, or if work is less than 15 days.
 - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

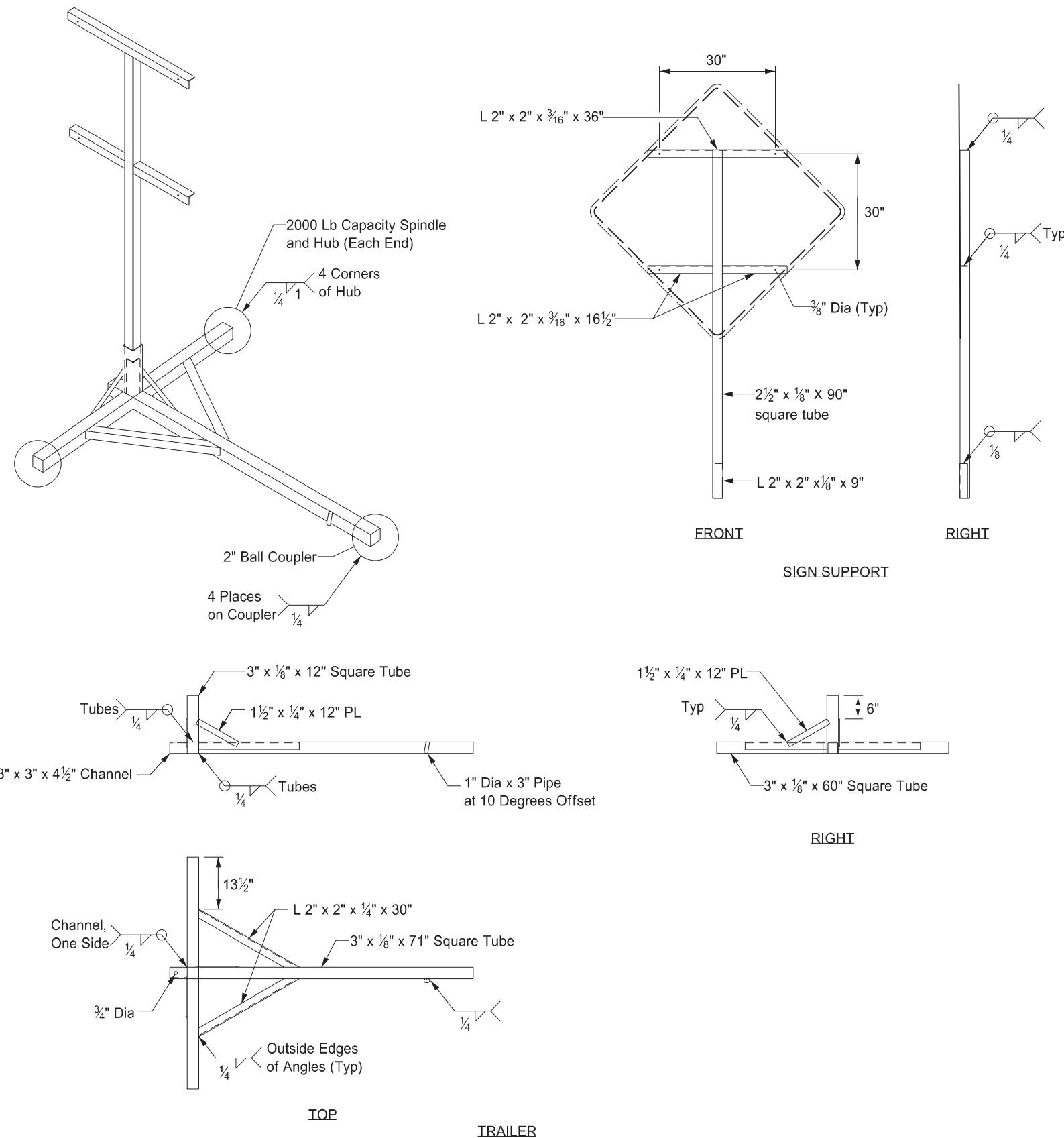
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes



PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



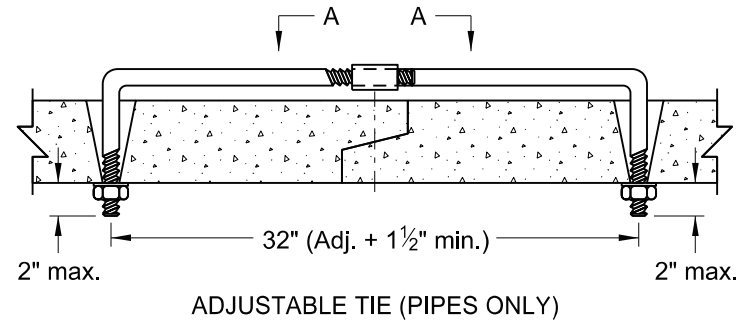
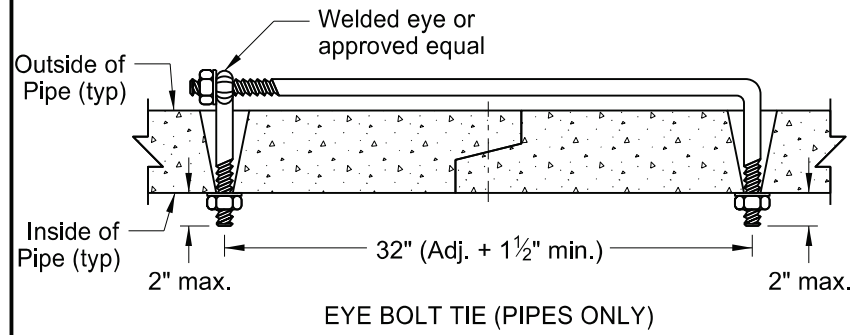
Notes:

- ① Maximum 250 pound weight of assembly.
- ② Use a 14" wheel and tire.
- ③ Use no automotive and equipment axle assemblies for trailer-mounted sign supports.
- ④ Other NCHRP 350 or MASH crash tested assemblies are acceptable.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE
12/02/2020	Updated Note to active voice.

KIRK J. HOFF
 REGISTERED
Kirk J Hoff
 PROFESSIONAL
 PE-4683
 ENGINEER
 NORTH DAKOTA
 12 02 2020

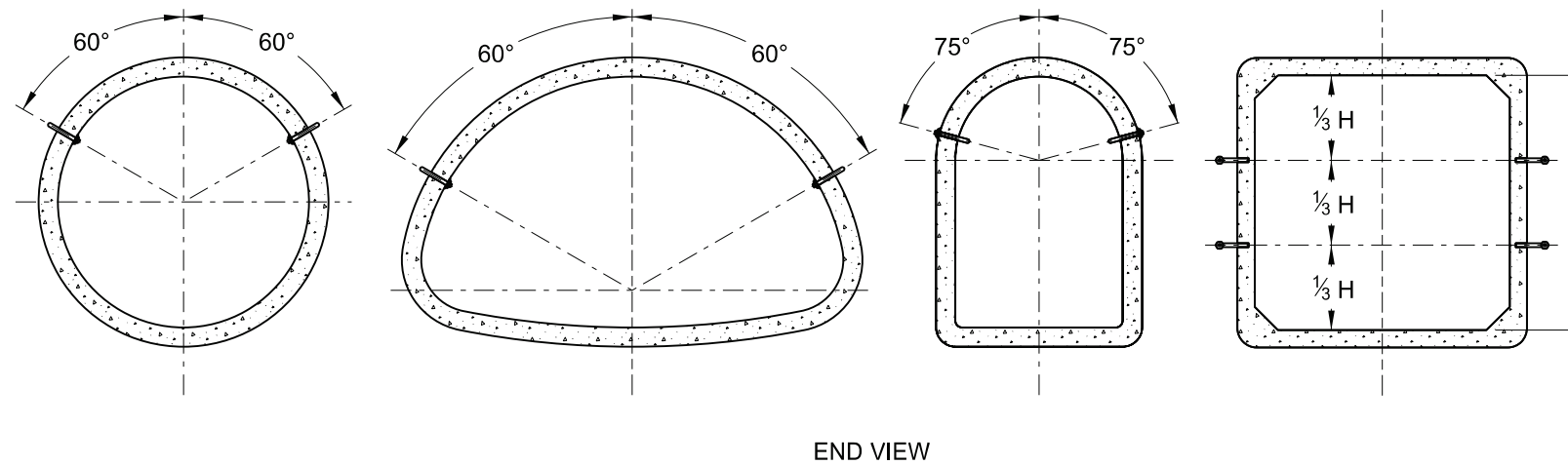
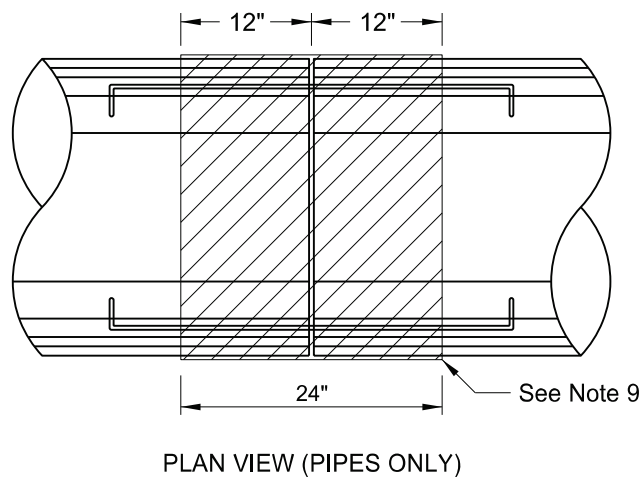
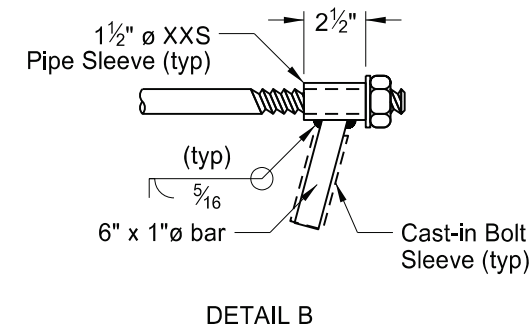
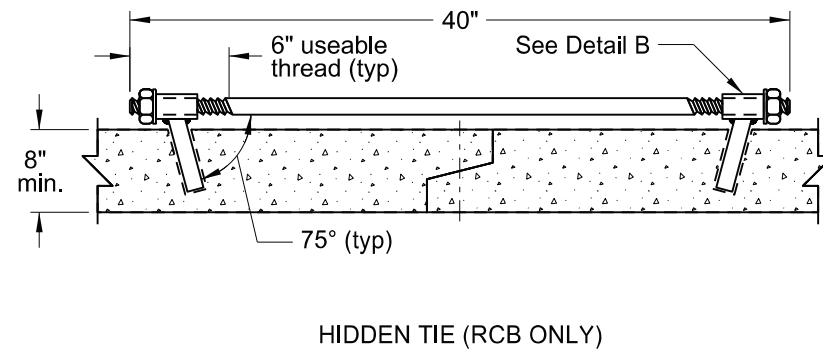
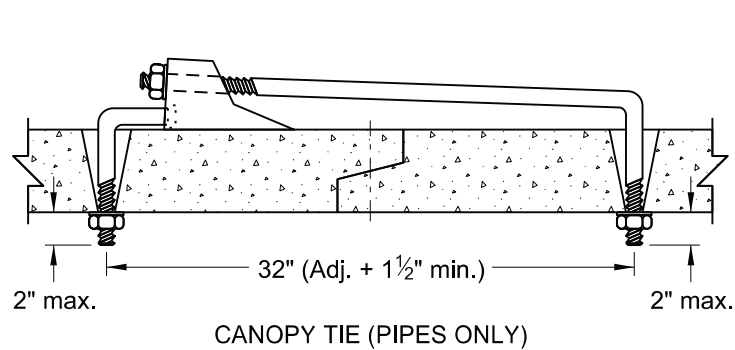
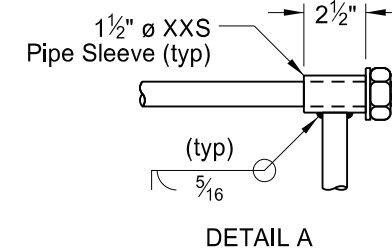
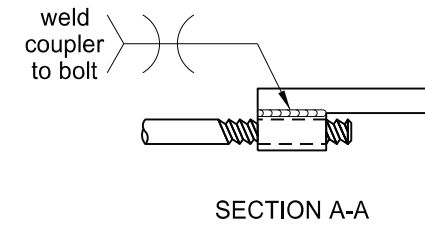
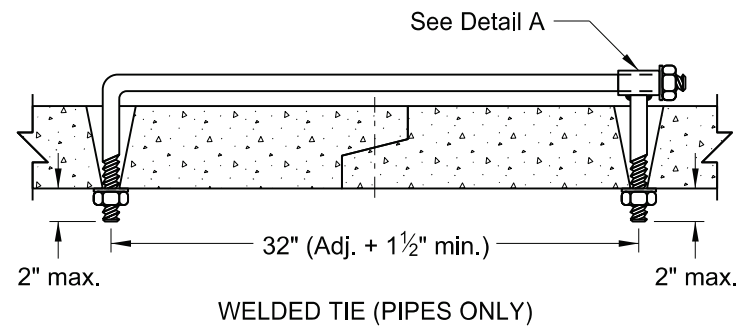
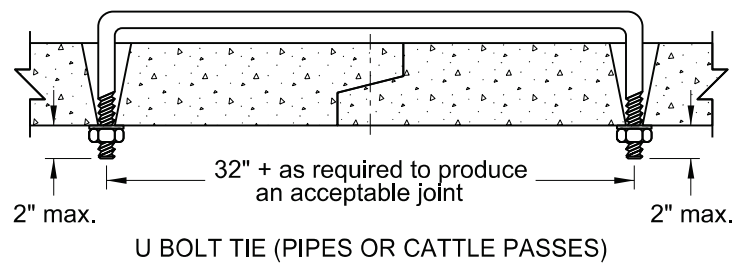
CONCRETE PIPE, CATTLE PASS, OR
PRECAST CONCRETE BOX CULVERT TIES



REQUIRED SIZE OF TIE BOLTS		
PIPE SIZE	THREAD Ø	XXS PIPE SLEEVE INNER Ø
18" - 24"	5/8"	3/4"
30" - 66"	3/4"	1"
72" - 120"	1"	1 1/4"
RCB/CATTLE PASS	1"	1 1/4"

NOTES:

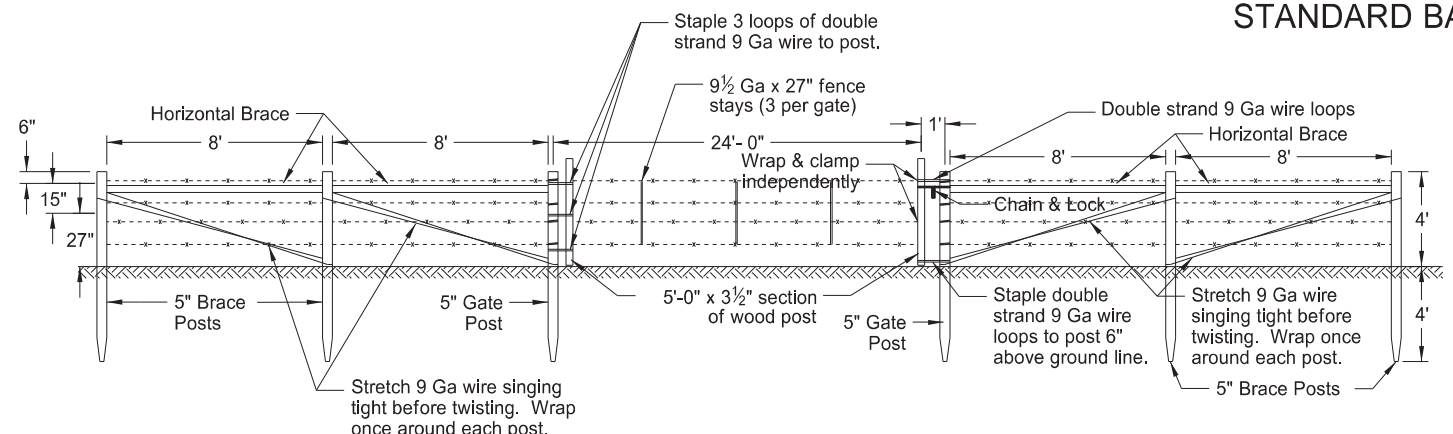
- The pipe size listed is the inside diameter of round pipe or the equivalent diameter of pipe arch.
- Insert pipe ties from the inside of the pipes and grout into place for Cattle Pass and Jacked and Bored pipes. Jacked and bored pipes with a diameter of 24" or less do not require pipe ties.
- Nuts and washers are not required on Jacked and Bored pipes or pipes with a 24" diameter or less. Insert and grout tie bars into place where nuts and washers are not used.
- Do not use pipe ties to pull the pipe or RCB sections tight. The ties are only for holding sections together.
- Use only tie bolt assemblies that have been hot dip galvanized in accordance with ASTM A 153.
- Holes in pipes to accommodate tie bolts will be precast. Tapered holes are permitted. Use holes that have a diameter 1/4" larger than the diameter of the thread. In precast RCB's, use holes that contain cast-in bolt sleeves with an inside diameter of 1 1/4".
- Include the cost of precasting the required holes and furnishing and installing the tie bolts in the price bid for the appropriate conduit or RCB pay item.
- Tie all centerline and approach RCP culvert joints. Tie all joints including the end sections of all free ends of storm drain systems. Free ends are defined as any storm drain end which does not terminate at an inlet or manhole. Outfall culverts with end sections which drain adjacent ditches are examples of free ends.
- Place joint wrap prior to installing ties. Firmly secure the wrap around the full perimeter. For concrete pipes, use Type S2 geotextile fabric and overlap the joint by 12" in both directions. For box culverts, use a waterproof membrane that meets ASTM C990. Provide a membrane that is a minimum of 12" wide and center it at the joint. Provide a minimum overlap of 2.5" at the seams.
- Use tie bolts that conform to ASTM A 36. Use heavy hex nuts that conform to ASTM A 563. Use washers that conform to ASTM F 436, Type 1. Use welded pipe sleeves and cast-in bolt sleeves that conform to ASTM A 53, Grade B.
- Provide lock washers or burr threads of concrete box ties after installation and tightening to prevent nut rotation.
- Tie RCB's as noted in the plans.



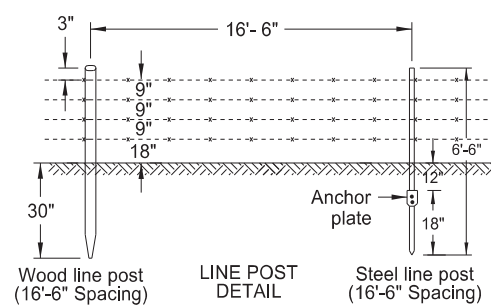
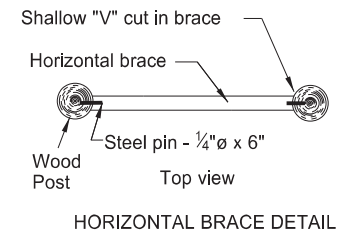
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-18-14	
REVISIONS	
DATE	CHANGE
7-21-15	Note 8
6-6-17	Notes 2-11 Table, Title, Labels
8-11-21	Notes 2-12 Table, Label
01-17-25	Notes 9-13 Table, Labels Section A-A, End View



STANDARD BARBED WIRE FENCE

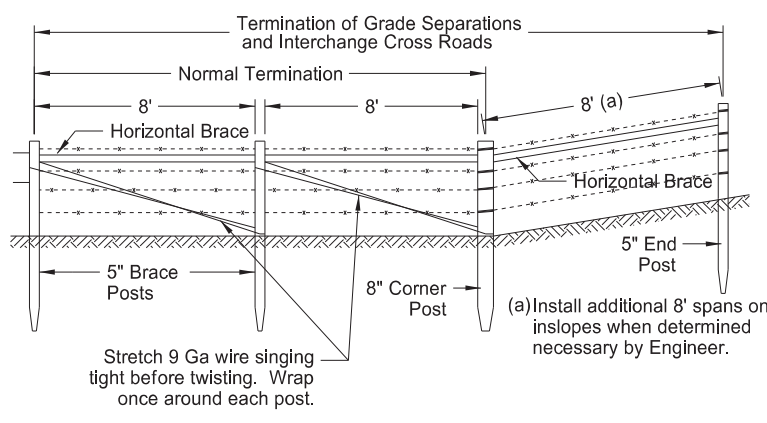


VEHICLE GATE

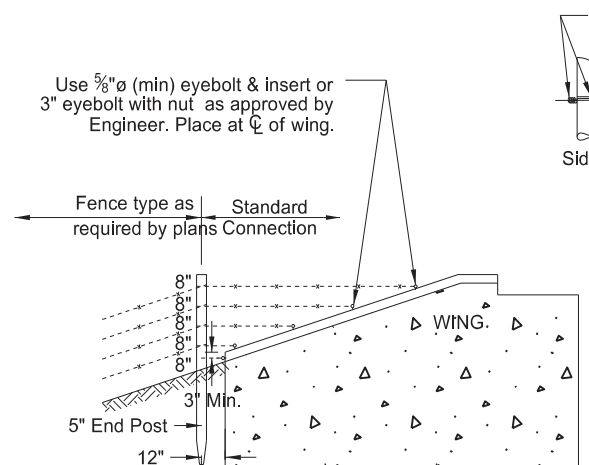


NOTES

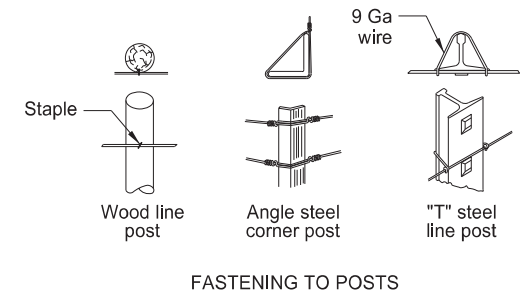
- No deduction in measured pay length of fence made for gates, corner assemblies, double brace assemblies, fence terminals, or depression fencing. Include all costs for abutment fencing in the price bid for fencing bid items.
- Install double brace assemblies at locations shown on the plans or established by the Engineer. Place adjacent fence terminals, corner assemblies, or double brace assemblies at a maximum spacing of 1,320 feet.
- Include all costs of furnishing and installing inserts and eyebolts in the unit price bid for fencing bid items. Use eyebolts galvanized according to AASHTO designation M-30; inserts of corrosion resistant material do not require galvanization. Use concrete inserts capable of developing the full strength of the 5/8" diameter threaded eyebolt, when installed in concrete.
- Determine post type used, either wood or steel, unless otherwise specified in the plans.
- Include the cost of bracing at vehicle gates in the price bid for "Vehicle Gate."



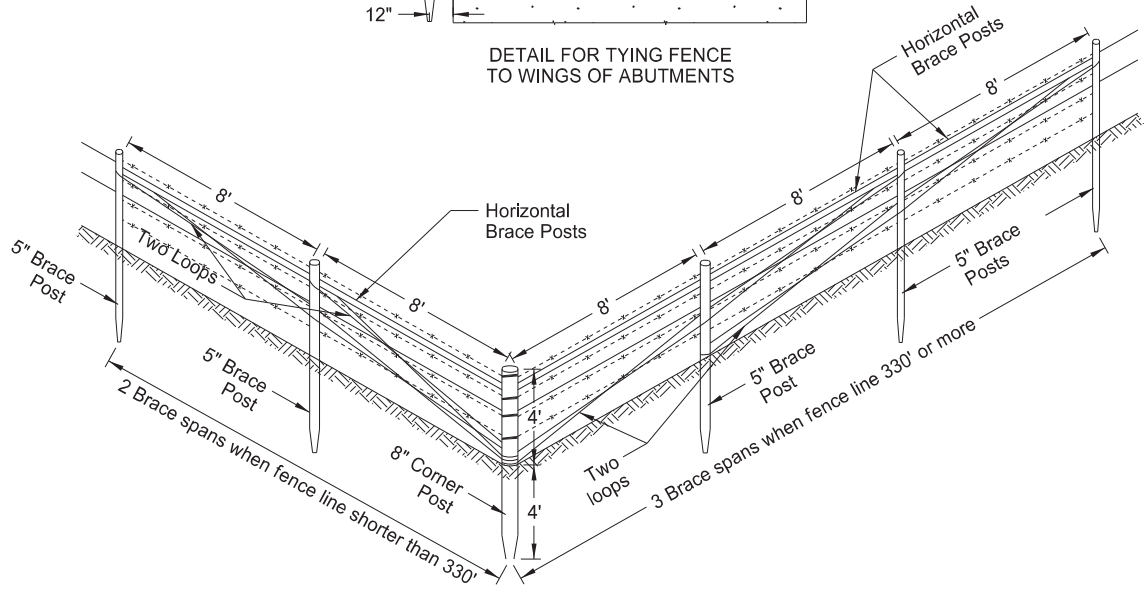
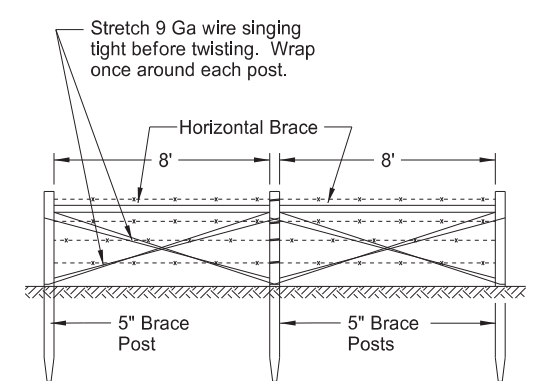
FENCE TERMINAL



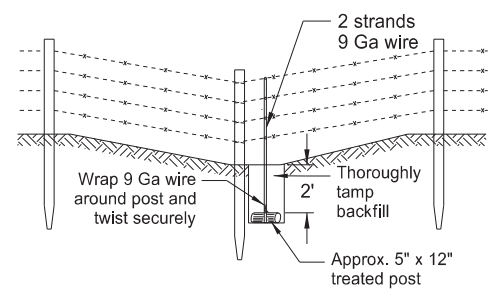
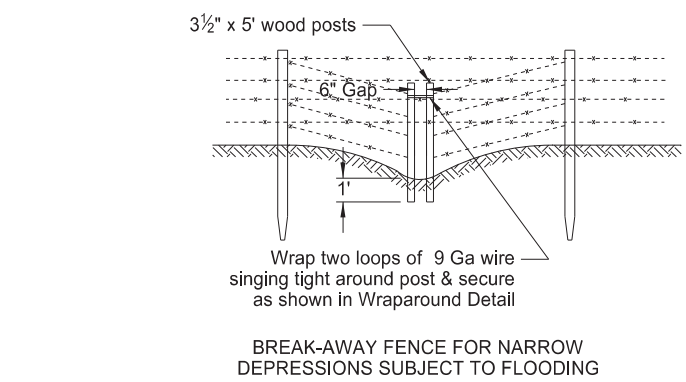
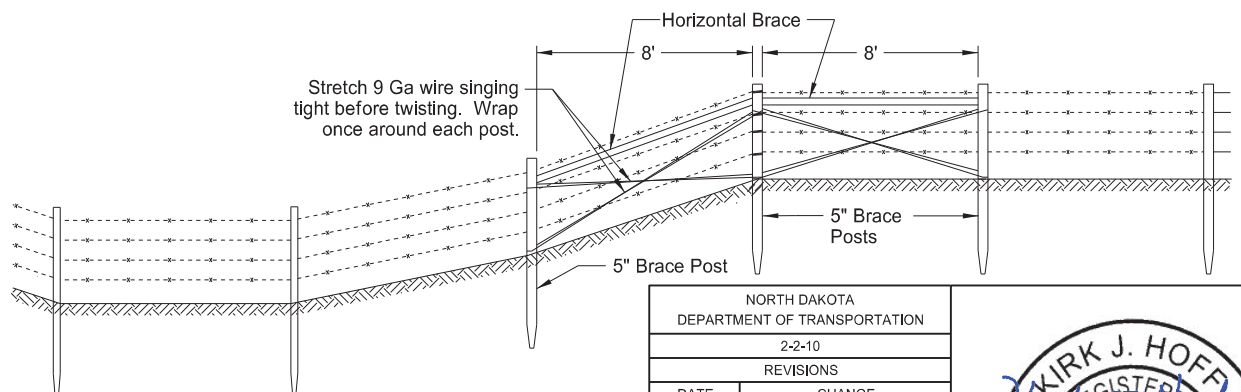
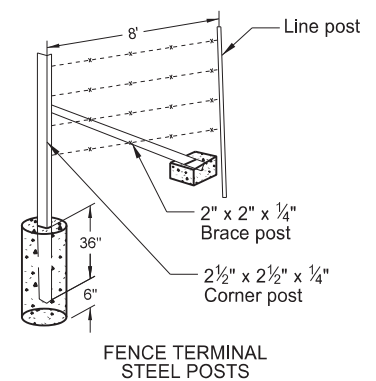
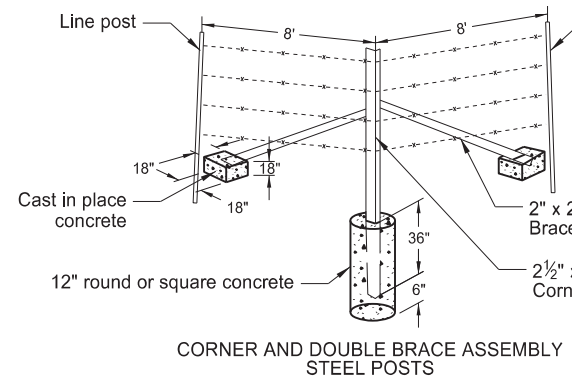
DETAIL FOR TYING FENCE TO WINGS OF ABUTMENTS



USE OF POST	TREATED WOOD		STEEL		
	Post dia.	Post length	Post length	Post wt. Lbs./Ft.	Anchor wt. Lbs.
Line post	3 1/2"	6'-6"	6'-6"	1.33	0.67
Corner post	8"	8'	7'	4.10	(Conc.)
End post	5"	8'			
Brace post	5"	8'	7'	3.19	(Conc.)
Gate post	5"	8'			
Horizontal brace	4"	8'	As approved by the Engineer		



CORNER ASSEMBLY

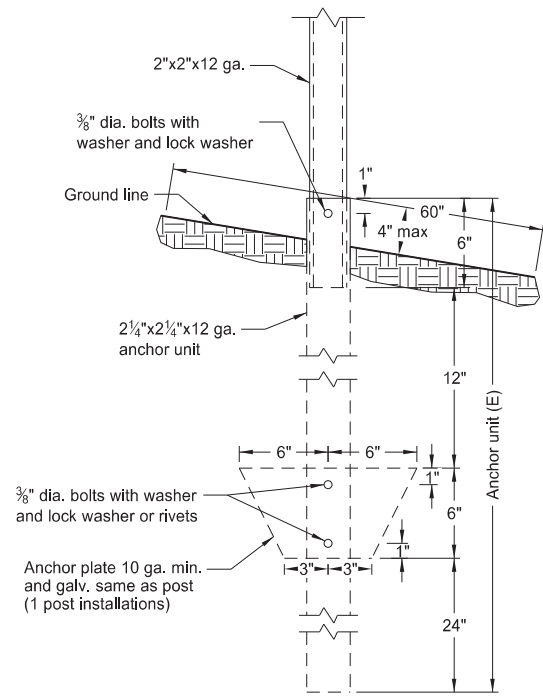


*Determine locations in the field and include in price bid for fencing. Use other methods of anchoring fence if approved by the Engineer.

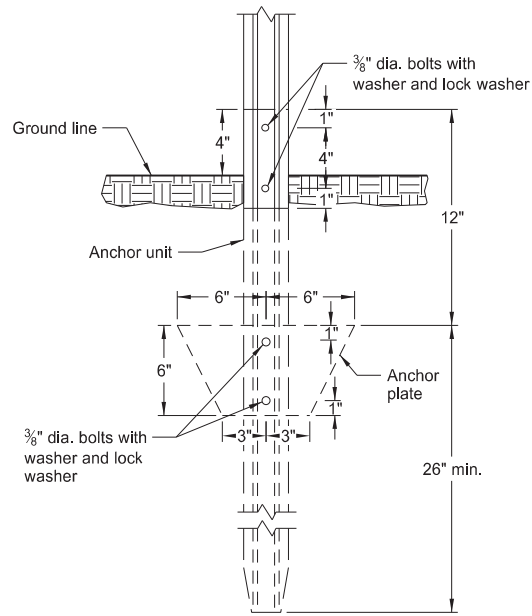
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-2-10	
REVISIONS	
DATE	CHANGE
10-02-12	Notes, steel assemblies/posts.
11-25-13	Revised Vehicle Gate.
10-17-17	Updated to active voice.
02-23-23	Revised post spacing/brace size.



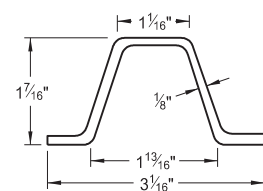
OBJECT MARKERS



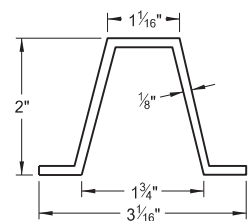
Perforated Tube Anchor Unit Assembly



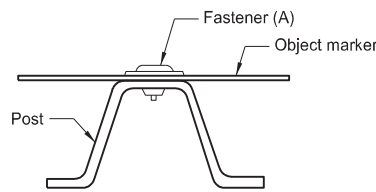
U-Channel Anchor Unit Assembly



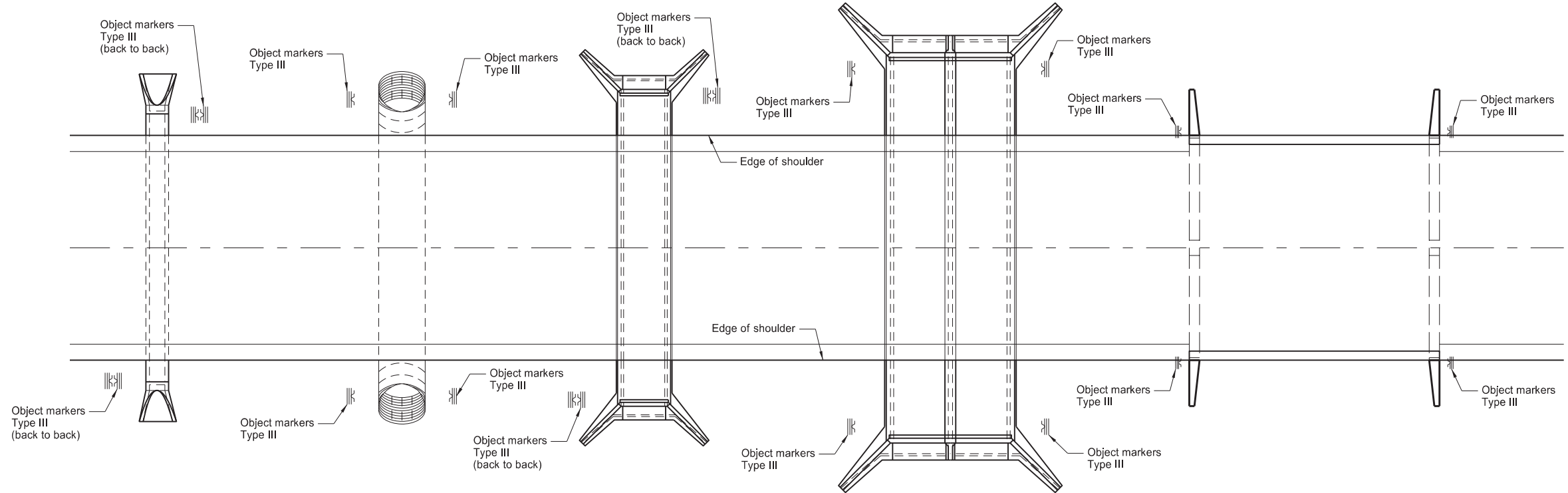
Steel Post Detail
Approx. 2 lb/ft



Aluminum Post Detail
Approx. 0.88 lb/ft



Fastener Detail



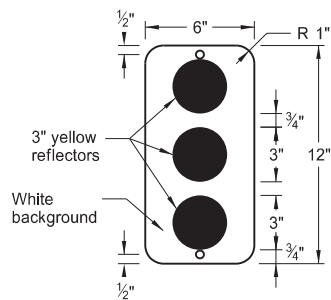
Pipe Culverts
10' max

Pipe Culverts
greater than 10'

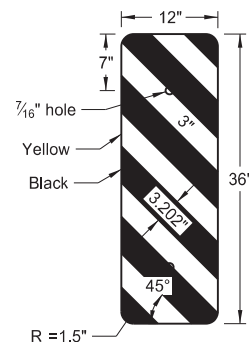
Box Culverts
10' max

Box Culverts
greater than 10'

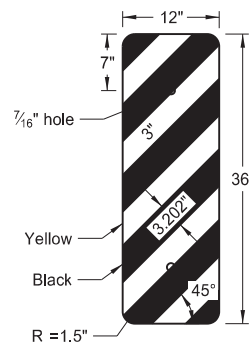
Bridges (B)



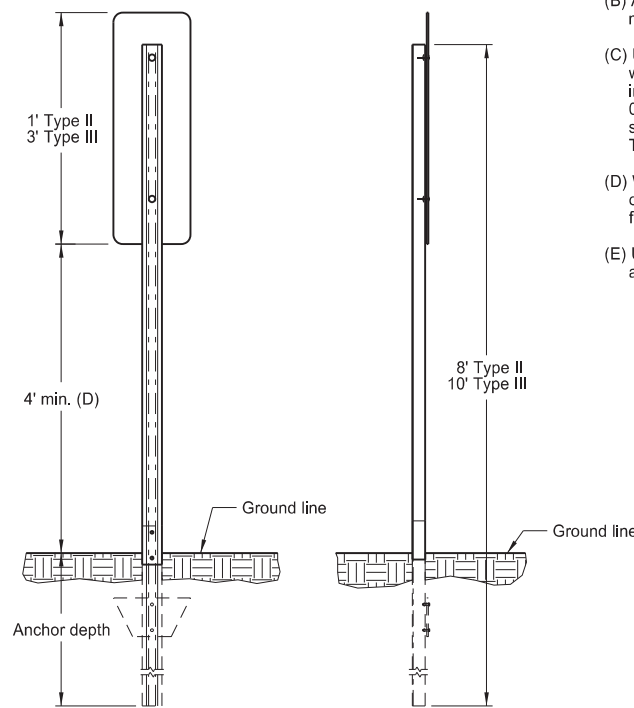
Object Marker
OM2-1V (C)
Type II



Object Marker Left
OM-3L (C)
Type III



Object Marker Right
OM-3R (C)
Type III



Object Marker
Installation Detail

Notes:

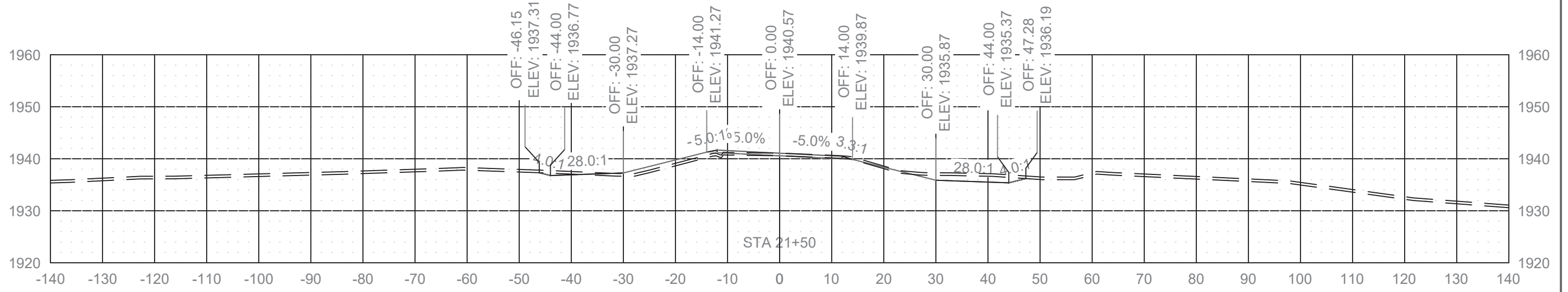
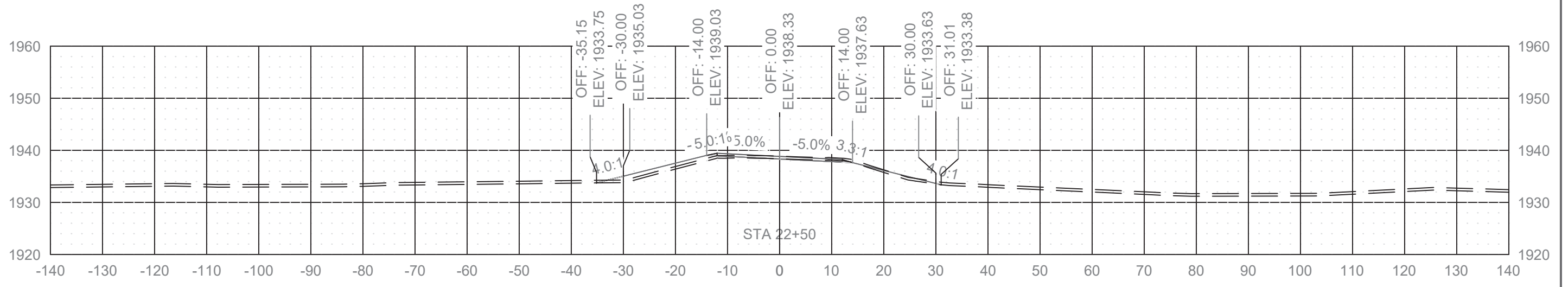
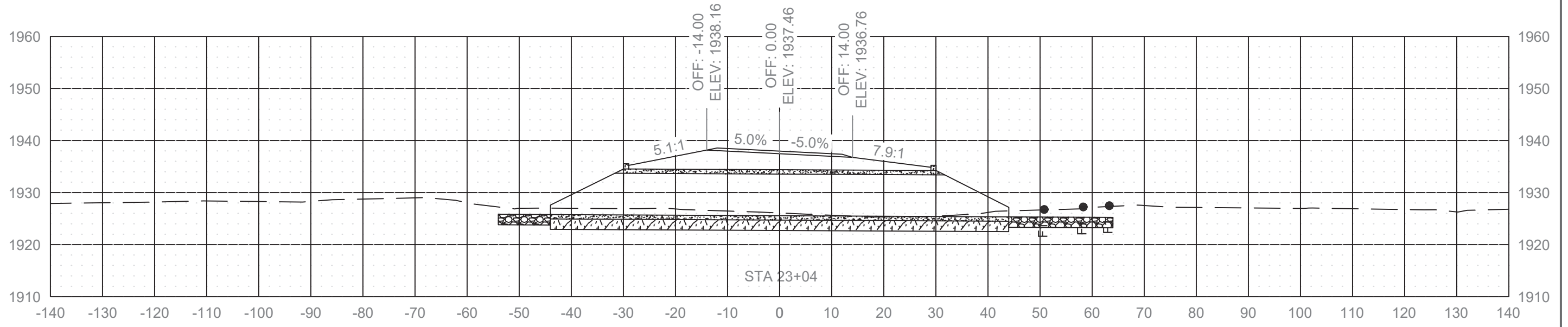
- (A) Use 3/8" dia. tension pin type or other non-rust vandal resistant fastener with min. outside dia. 1 3/16" flat washer.
- (B) At locations of approach guardrail with reflectors and end terminal with impact head object markers, do not install object markers.
- (C) Use two object markers for back to back mountings. On bridges where the distance between wheel guards is less than the approach width, mount object markers vertically on steel posts in front of the bridge railing on each side of highway to mark the horizontal clearance. Use 0.100" minimum thickness sheet aluminum for sign backing material. Use ASTM Type XI sheeting for Type III object markers and ASTM Type IV background sheeting with ASTM Type XI reflectors for Type II object markers.
- (D) When object marker is located 8' or less from shoulder or curb, provide 4' minimum vertical clearance from near edge of traveled way to bottom of sign. When located more than 8' from shoulder or curb provide 4' minimum vertical clearance from ground to bottom of sign.
- (E) Use 4" vertical clearance for anchor or breakaway base. Provide 4"x60" measurement above and below post location and back and ahead of post.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
7-18-14	Revised Note C
8-30-18	Updated notes to active voice and removed note.
9-05-19	New Design Engineer PE Stamp.
8-08-24	Electronic Stamp/Signature.

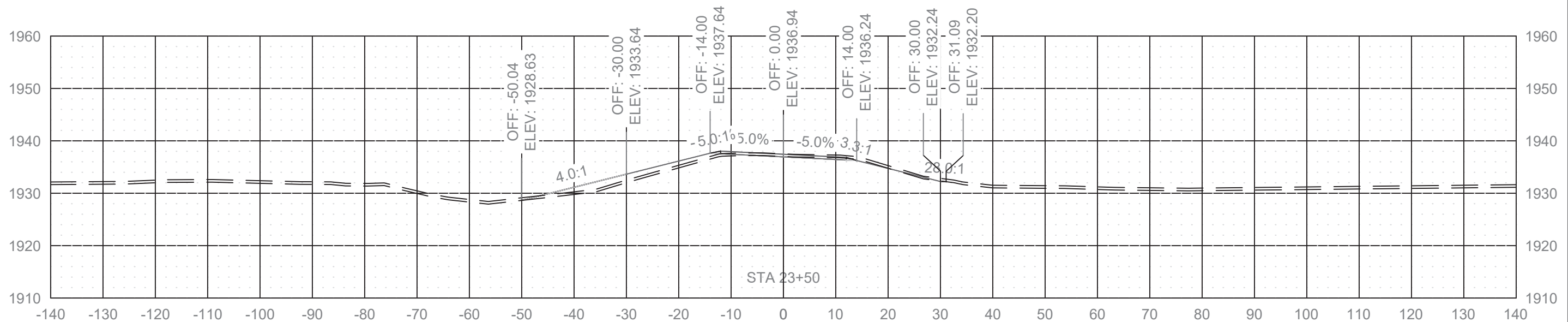
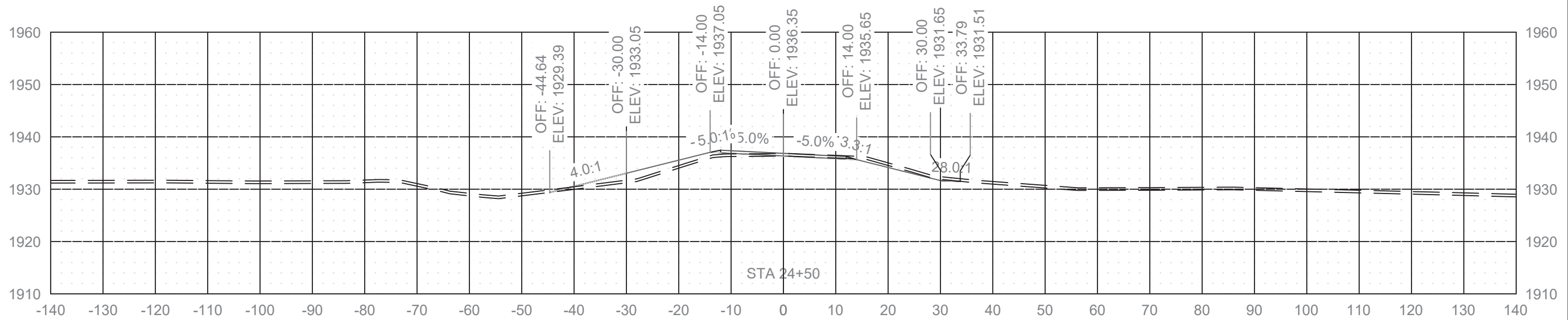


08/08/24

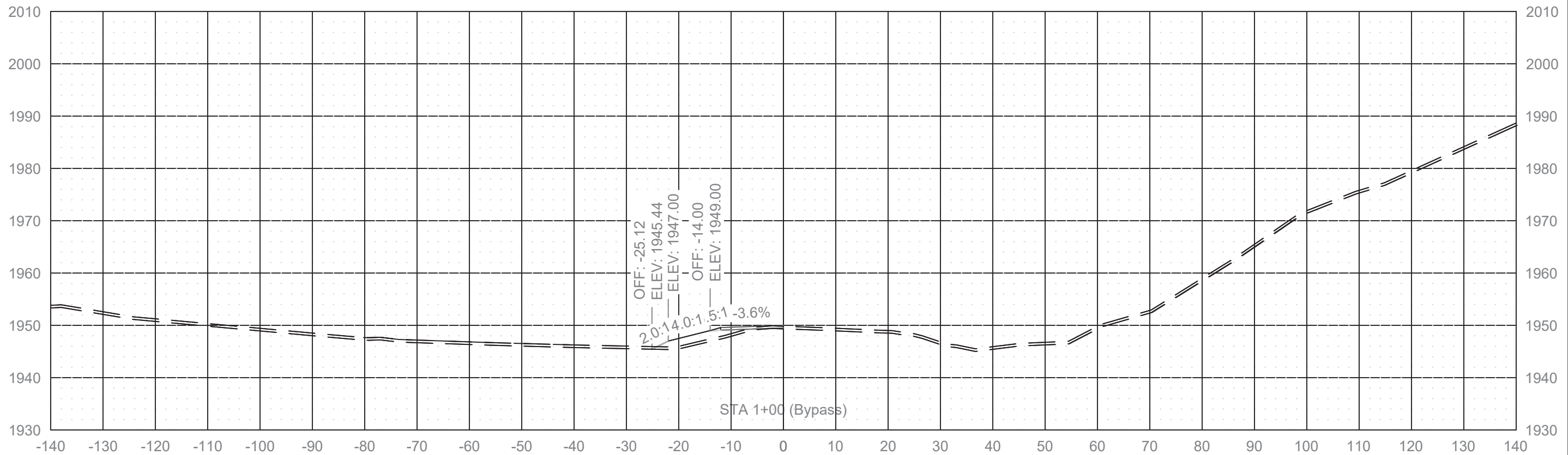
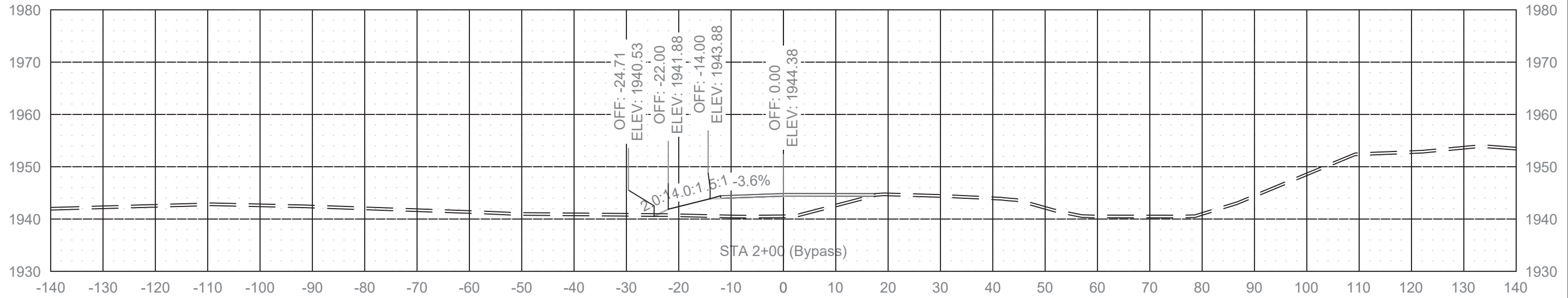
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ND	BRC-3027(056)	200	1



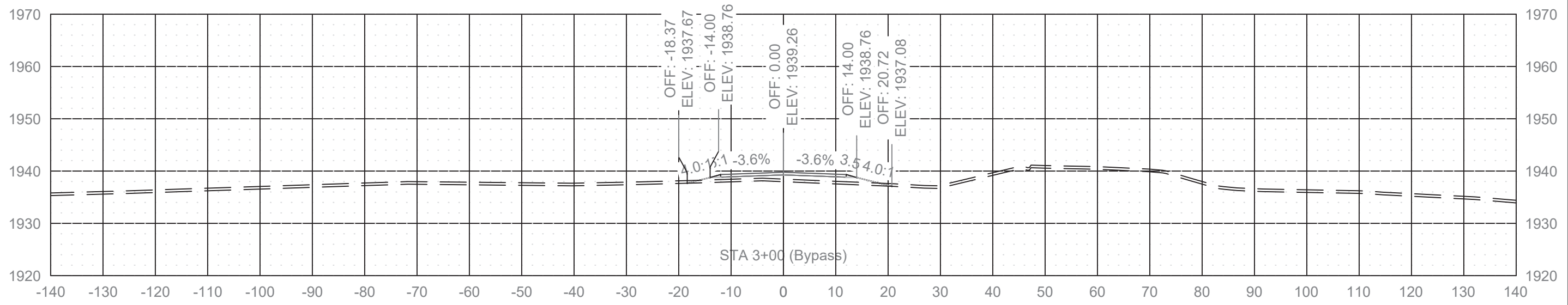
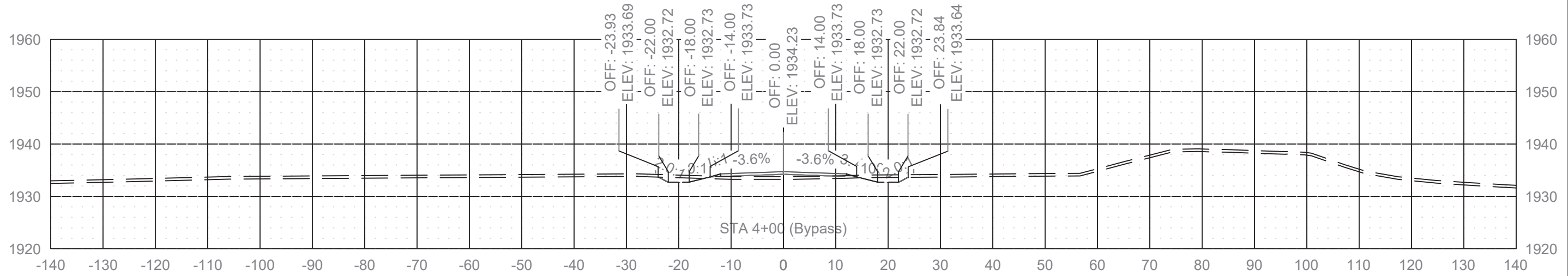
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	ND	BRC-3027(056)	200	2



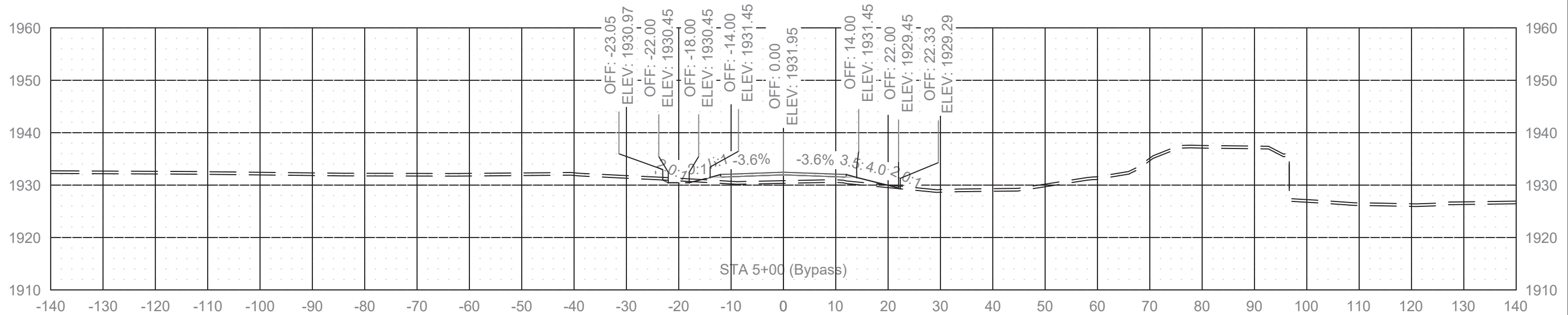
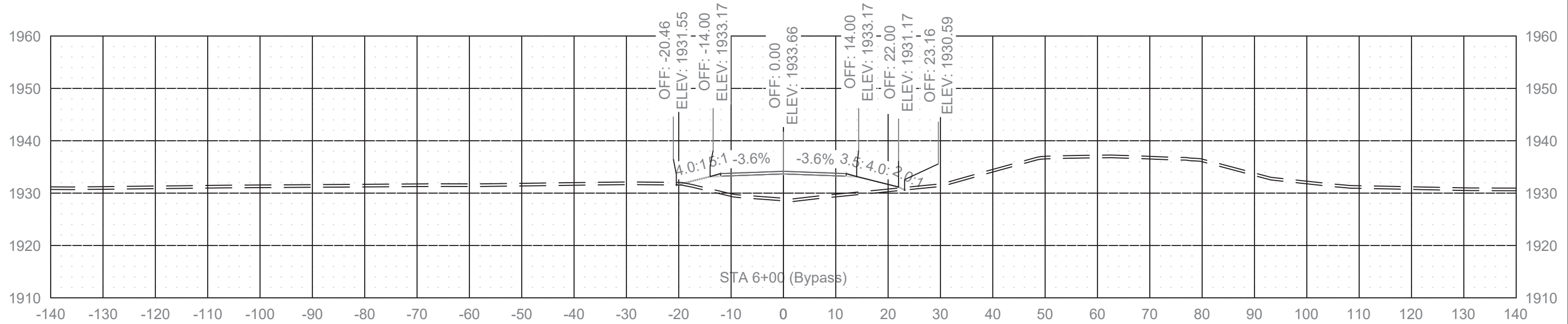
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRC-3027(056)	200	4



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRC-3027(056)	200	5



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRC-3027(056)	200	6

